

# IDEA Supermax<sup>®</sup>



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# **IDEA Supermax<sup>®</sup>**

Combination Card for the  
IBM AT Computer



## **Installation and Reference Manual**

IDEAssociates, Inc.  
29 Dunham Road  
Billerica, MA 01821  
(617) 663-6878

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# WARNING



This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on,\* the user is encouraged to try to correct the interference by one or more of the following measures:

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- Move the computer away from the receiver
- Plug the computer into a different outlet so that computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems."

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004000003454.

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We are constantly striving to improve our documentation.

You can help us by answering the questions below and mailing this form to us.

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Please rate this document.

	Excellent	Good	Poor
1. Does the product work the way it is described in the manual?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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9. After reading this document, are you able to use the product?                      yes ☐      no ☐

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\_\_\_\_\_  
\_\_\_\_\_

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\_\_\_\_\_  
\_\_\_\_\_

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IDEAssociates guarantees all Products for one year. During the one year warranty period, IDEA will repair or replace your Product at no additional charge. If the warranty period expires, IDEA will repair a Product on a time and materials basis. Refer to Appendix G for details of the limited warranty.

IDEAssociates has an established network of computer dealers throughout the United States and Europe. To place an order or to locate the nearest dealer, call nationwide at (800) 257-5027.

IDEAssociates supports the IDEA Supermax on the IBM AT Computer.

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# Section I:

## Introduction



Congratulations on your purchase of the IDEA Supermax Combination Card for the IBM AT. This manual gives step-by-step instructions for installing and using your IDEA Supermax card. IDEA hopes that you find our product totally satisfactory. If you have any questions, problems, or compliments, please call us at (800) 257-5027.

The IDEA Supermax Combination Card is available with up to 4.0 Megabytes of memory (1.5 Megabytes of RAM memory on the motherboard and 2.5 Megabytes of memory on the optional daughterboard). The following options are also available on this board: parallel port and 2 serial (RS 232C) ports. The IDEA Supermax Card comes with RAMFLOPPY disk emulation, printer spooler, parallel printer selection, and diagnostic software (all found on the IDEAmenu software disk).

IDEA believes in the quality of its products and guarantees your IDEA Supermax Combination Card for one year. After the installation is complete, please fill out the warranty card and return it to IDEA Associates.

---

# Getting Started

## The Box

Note the amount of protective material we have placed around the Combination Card. This ensures that you receive an undamaged board.

Please save the inside box and packing material. If you need to return the IDEA Supermax Combination Card for upgrade or repair, this is the best packaging for safe shipping.

## Inventory Checklist

The following is a list of the components you should have received.

- IDEA Supermax Combination Card
- IDEAMenu Diskette with Utility and Diagnostic programs
- Installation and Reference Manual
- First Serial Port Connector Cable (serial port option only)
- Second Serial Port Connector Cable (serial port option only)
- Optional Daughterboard
- Warranty Card

---

## Careful!

During the installation process please be careful with your IDEA Supermax Combination Card. Do not bend or drop the card. Keep all food and beverages away from the card.

## Tool Requirements

A medium size, flat-blade screwdriver is required to remove the five screws holding the back cover of the IBM AT.

## Serial Number

Please turn your IDEA Supermax Combination Card to the circuit side. The serial number is on a white sticker located on the board. Record this NOW on both your warranty card and on the line provided below. If you also purchased a daughterboard, record the serial number below and on the warranty card.

Serial Number: \_\_\_\_\_  
(Motherboard)

Serial Number: \_\_\_\_\_  
(Daughterboard)

---

## Back-up Diskettes

Be sure you have the IDEAmenu diskette, an operating system diskette (preferably a back-up copy of the original provided by IBM) and a blank diskette available. Use the blank diskette to make a back-up copy of your IDEA Supermax diskette before beginning installation. Instructions on how to copy files are given under "COPY Command, DOS Commands," in the *IBM Disk Operating System Manual*.

## IDEA Supermax Combination Card - Motherboard

Each bank of eighteen RAM chips (see Figure 1-1) represents 128K bytes of memory if each chip is 64K, or 512K of memory if each chip is 256K. The banks are populated in rows from top to bottom. Please make sure that the number of banks corresponds to the amount of memory you ordered (e.g., 128K bytes means the top bank is populated with 64K chips).

The location of the Parallel Port, the two Serial Ports (RS 232C), switches, etc., is shown in Figure 1-1.

If you have not ordered all of the options, there may be empty sockets or spaces on the board to the right of the banks of memory.

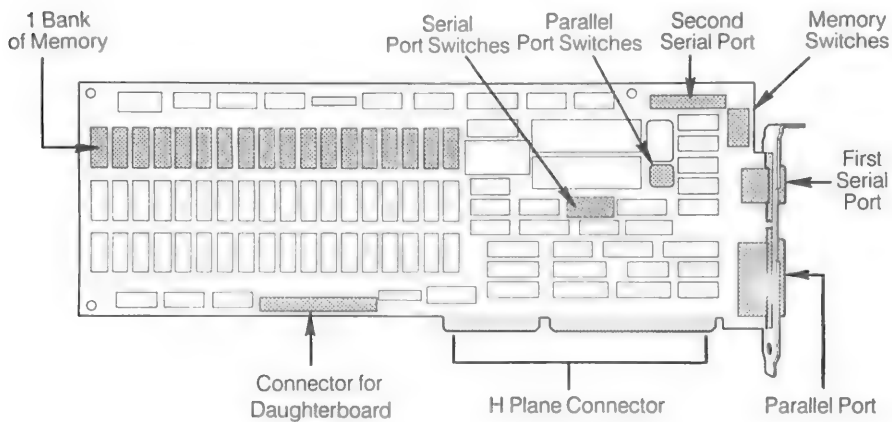


Figure 1-1: IDEA Supermax Combination Card (Motherboard)

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# IDEA Supermax Daughterboard

Once all three banks of memory on the motherboard are populated, a daughterboard can be attached to the motherboard. The daughterboard can be populated with either 64K RAM chips or 256K chips. If each bank on the daughterboard is populated with 64K chips, the total memory in one bank is 128K. If each bank is populated with 256K chips, the total memory in one bank is 512K.

Unlike those on the motherboard, the banks on the daughterboard are populated in columns from left to right. Two columns of chips represent one bank. Please make sure that the number of columns corresponds to the amount of memory you ordered (e.g., 128K bytes of memory means that the two left columns are populated with 64K chips). Refer to Figure 1-2.

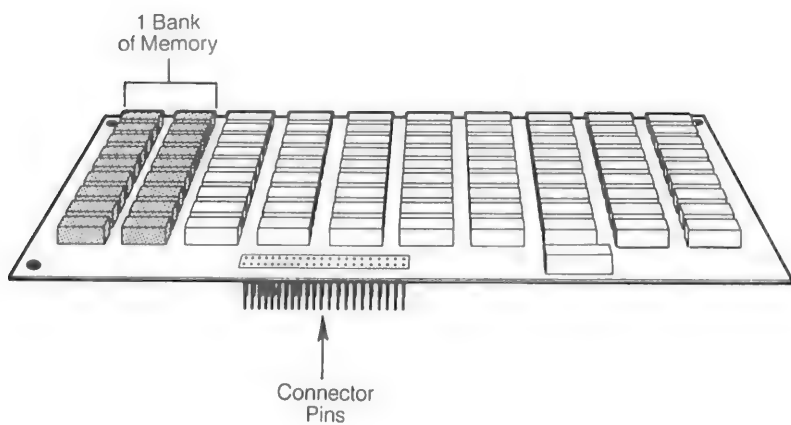


Figure 1-2: Daughterboard

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# Attaching the Daughterboard to the Motherboard

When you received the daughterboard you also received 3 white posts. To insert the posts into the motherboard, place the board on a flat, clean surface. Align each post with a hole on the edge of the motherboard and press the post into the hole. Next, align the 3 holes on the daughterboard with the posts and press the daughterboard onto the posts until the posts snap through the holes. See Figure 1-3.



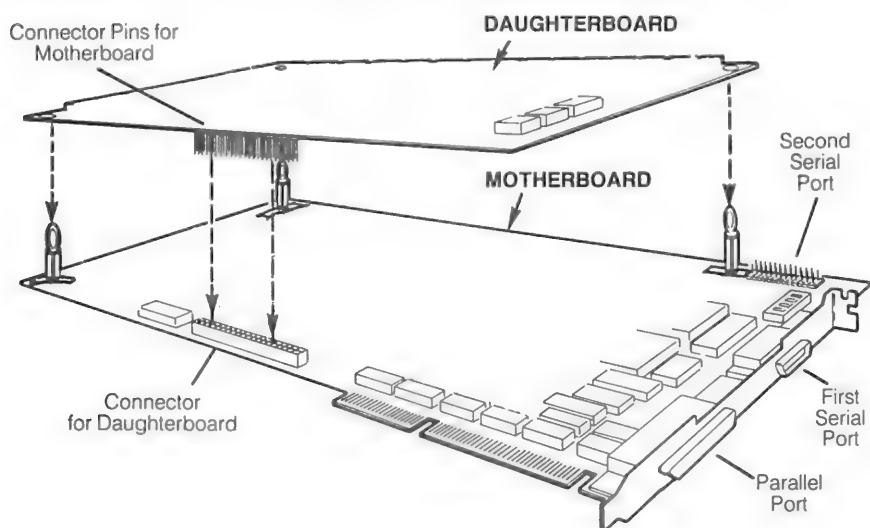



Figure 1-3: Connecting the Motherboard and Daughterboard



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## **Section II: Hardware Installation**



The installation of your IDEA Supermax Combination Card is accomplished in a few easy steps. Please read all of the instructions that correspond with the following steps before beginning the installation.

1. Opening and removing the IBM AT cover
2. Setting switches on the IDEA Supermax board, setting the jumper on the IBM AT system board (if required)
3. Attaching the second serial port cable (if this option is present)
4. Inserting and aligning the IDEA Supermax Combination Card
5. Replacing the IBM AT cover and recabling your system

After installing the hardware, please test your new IDEA Supermax Combination Card with the diagnostic software described in Section III.

---

# Opening the IBM AT

## Preliminary Steps

1. Turn the power switch OFF.
2. Turn all peripheral devices (disk drives, printers, monitors) OFF.
3. Unlock the unit: turn the key on the front of the IBM counterclockwise in the lock, and remove the key.
4. Unplug the computer and all peripherals from the wall outlet.
5. Carefully note where each cable is connected, then disconnect all cables from the back of the computer.

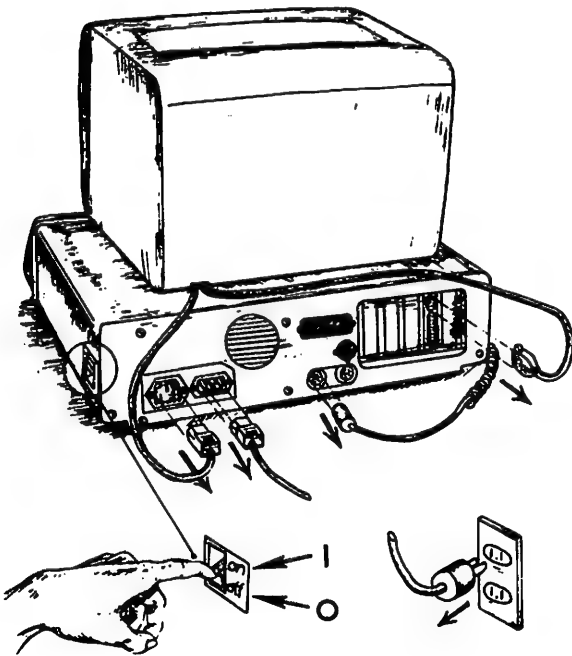


Figure 2-1: Detaching Cables and Removing Power

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## Cover Removal

- Move your keyboard and all external options away from the work area.
- Position the computer to allow rear access.
- The back panel of the AT is attached to the unit with plastic fastener strips. Pull the back panel from the IBM AT.
- The cover screws are now visible (refer to Figure 2-2). Using a flat-blade screwdriver, remove the 5 cover mounting screws.

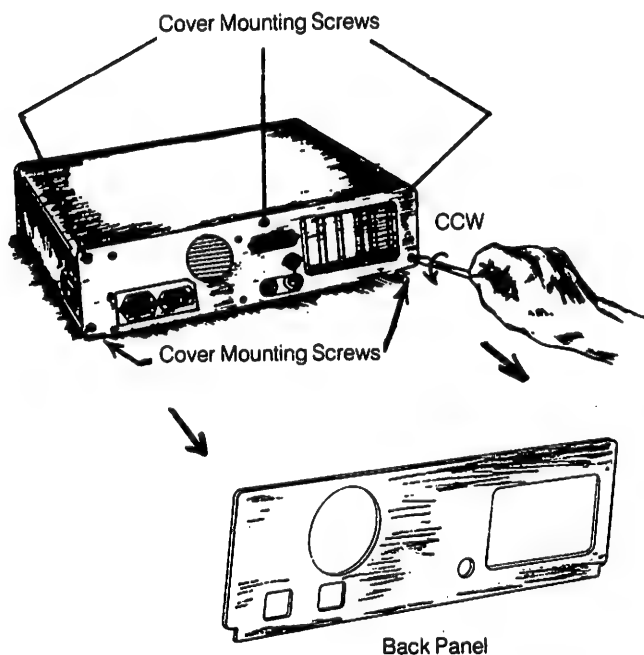


Figure 2-2: Removing the Back Panel and Location of Cover Screws

- 
- Carefully slide the cover toward you as illustrated in Figure 2-3.

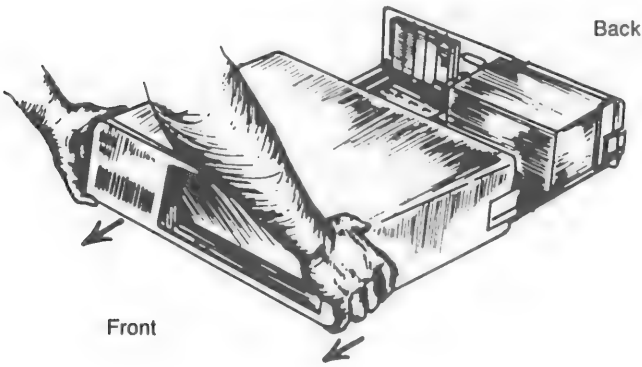


Figure 2-3: Removing the IBM AT Cover

---

# Setting Switches and the IBM Jumper

You must set the switches on the IDEA Supermax Combination Card before installing it. This section provides instructions for setting the sliding switches used on the Memory and Serial Port switches and the rocker switches used on the Parallel Port switches of the IDEA Supermax. To change a switch setting on a sliding switch, simply slide the switch left or right, or up or down. To change a switch setting on a rocker switch, press down on one edge of the switch.

In order to correctly set the switches, you must first gather information about the memory in your system and in any options. The following paragraphs help you to determine correct memory which will be used later in setting the switches and in responding to the IBM Setup prompts.

## Determining Current Memory

To determine the amount of memory in your IBM AT, you must add the original memory of the IBM AT (256K or 512K) to any optional memory you previously installed (do not count the memory on the IDEA Supermax at this time). Enter the total memory into the box provided in Figure 2-4. This number represents the starting address for the IDEA Supermax Combination Card.

Amount of Current IBM AT Memory



Figure 2-4: Original IBM AT + Optional Memory (do not count IDEA Supermax memory) = Starting Address of IDEA Supermax

---

Next, determine the amount of memory on your IDEA Supermax Combination Card. If you do not know, consult your packing slip or purchase order form. Place this number in the box provided in Figure 2-5.

Amount of Memory on IDEA Supermax



Figure 2-5: IDEA Supermax Memory

Now, add the number in the box in Figure 2-4 to the number in the box in Figure 2-5. Place the sum of these numbers in the box in Figure 2-6.

Total Memory

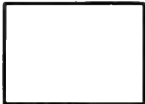


Figure 2-6: Original + Options + IDEA Supermax Memory



## Setting the Memory Switches

Refer to Figure 1-1 for the location of the memory switches on the IDEA Supermax Card. Use the number in the box in Figure 2-4 (starting address for IDEA Supermax) to set the memory switches. Use the table shown in Figure 2-7 to determine the appropriate switch settings for your unit.

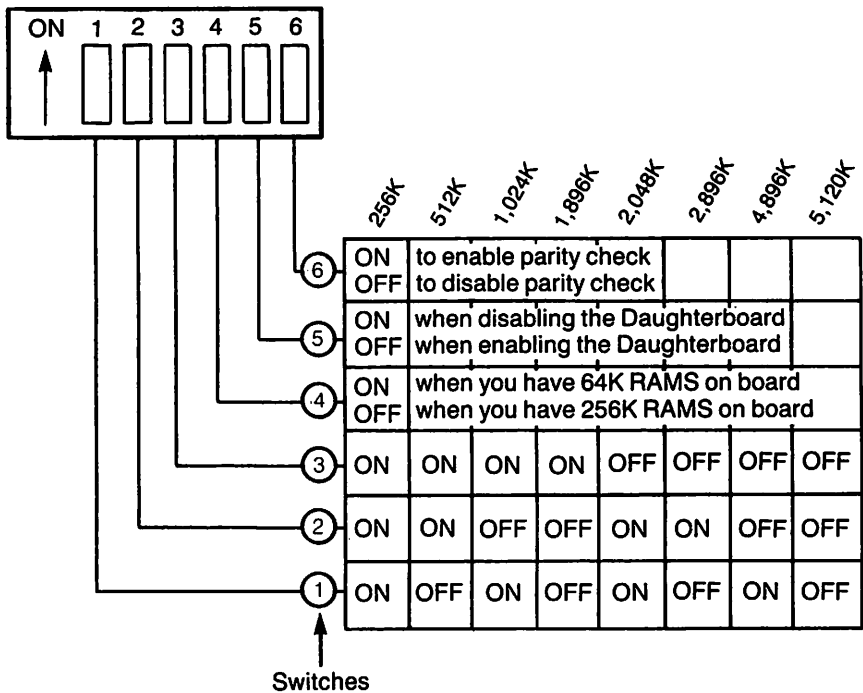


Figure 2-7: Setting the Memory Switches for Starting Address

# Optional Serial Port Switches

- If your IDEA Supermax Card was ordered with only one serial port, you can set that port to be COM1, COM2, or you can disable it. IDEA recommends that you use the serial port as COM1 if you have no other serial port. Refer to Figure 2-8 to set or disable your serial port.
- If your IDEA Supermax Card was ordered with two serial ports, those ports can be set as COM1, COM2, COM3, one port can be disabled or both ports can be disabled. Refer to Figure 2-8 to set or disable your serial ports. For alternate examples of switch settings, see Appendix B.

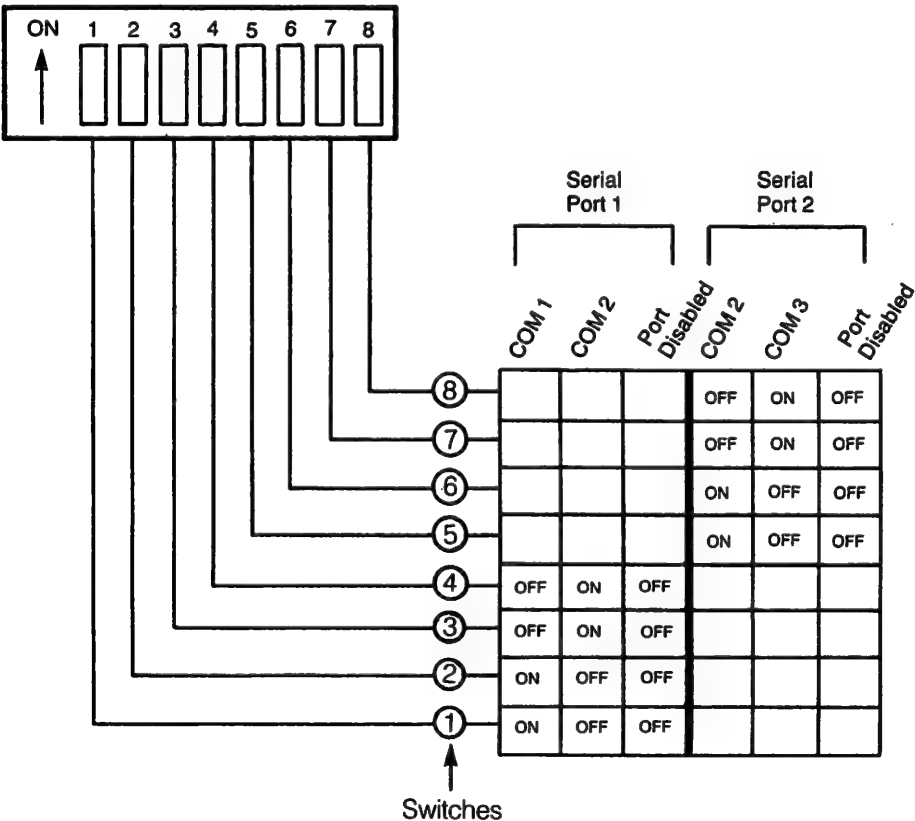


Figure 2-8: Setting or Disabling One or Two Serial Ports

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## Optional Parallel Port Switches

The IDEA Supermax Parallel Port may be used as LPT1 (printer 1) or LPT2 (printer 2). The IDEA parallel printer port should be set as LPT1 unless there is another parallel printer port (other than the monochrome parallel printer adapter) already set as LPT1. In this case the IDEA Supermax parallel printer port should be set as LPT2. Refer to Figure 2-9. (See Appendix B for additional information.)

If you have more than one parallel printer, refer to IDESPPOOL in Section IV to designate the printer.

**NOTE:** To set the rocker switches of the parallel port, press down the ON side of the switch to set it to ON or press down the OFF side of the switch to set it to OFF. Please use care when setting these switches.

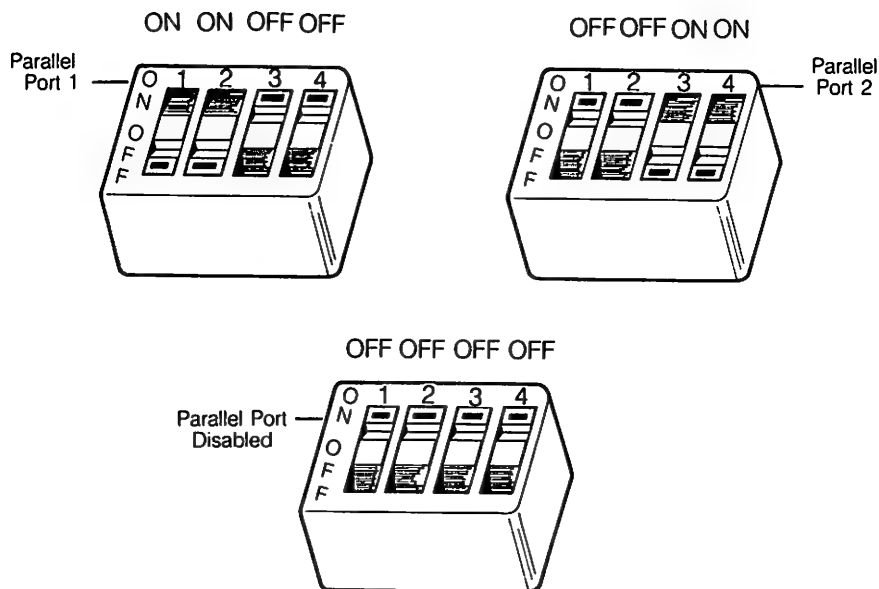


Figure 2-9: Setting the Parallel Port Switches

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# Setting the IBM AT Jumper

There is a jumper located on the IBM AT board (refer to Figure 2-10).

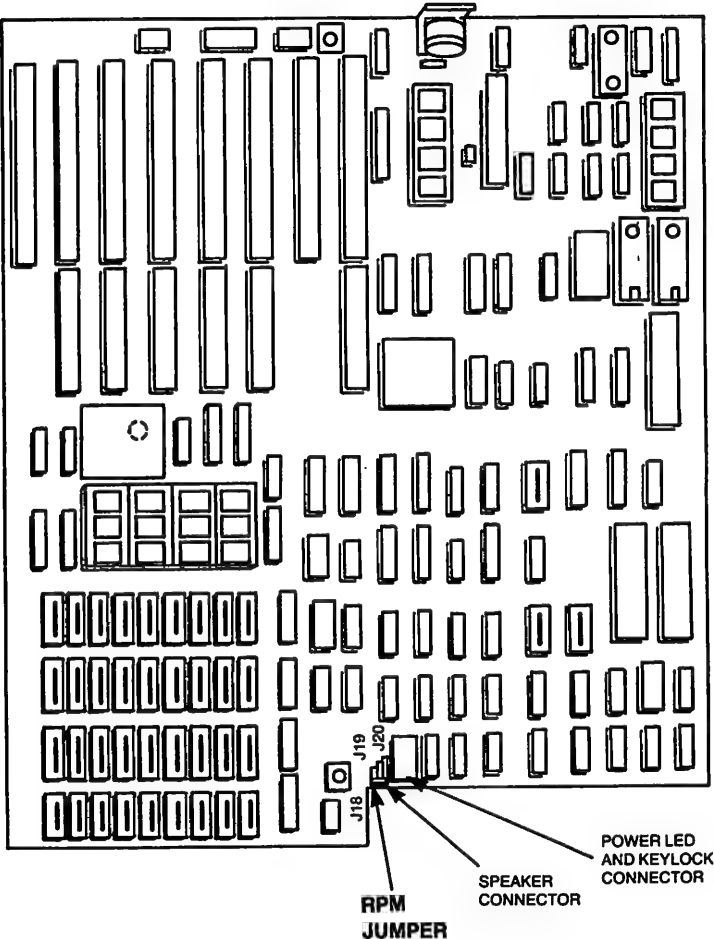


Figure 2-10: Location of the Jumper on the IBM AT System Board

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When you purchased your IBM AT the jumper was already set as shown in Figure 2-11A. If both memory banks on the IBM AT system board are populated, do not change the jumper setting.

If only one memory bank on the IBM AT system board is populated, and you add the IDE A Supermax Card, you must reset the jumper to the setting shown in Figure 2-11B. This allows the system to bypass the second, unpopulated memory bank on the IBM AT system board.

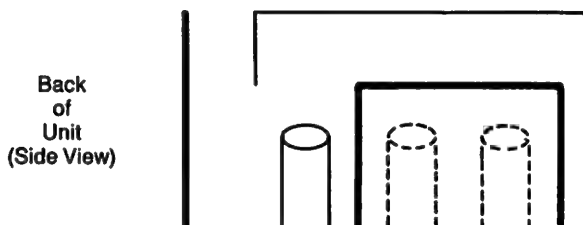


Figure 2-11A: IBM AT Jumper Setting as Set When Purchased

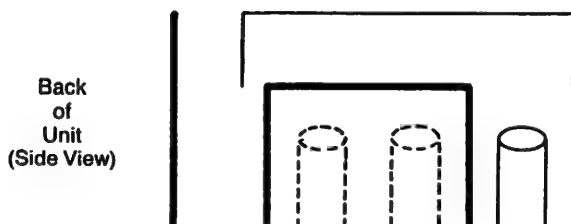


Figure 2-11B: IBM AT Jumper Setting After Resetting the Jumper

---

# Inserting the IDEA Supermax Combination Card

## Expansion Slot Cover Removal

Once the IDEA Supermax Combination Card switches are set (and the jumper on the IBM AT system board is reset - if necessary), you are ready to remove the slot cover from the IBM.

There are 8 system expansion slots in the IBM AT. The first two slots are generally taken up by IBM AT system boards. Of the remaining slots, be sure that you place the IDEA Supermax Card into a slot that is equipped with a two H connector interface (refer to Figure 1-1). Remember that if you have a daughterboard attached to the IDEA Supermax (motherboard), you must have two slots available in the IBM AT.

- Use a flat-blade screwdriver to remove the screw that holds the system expansion slot cover in place. Refer to Figure 2-12.
- Save the screw for installation of the IDEA Supermax Combination Card.

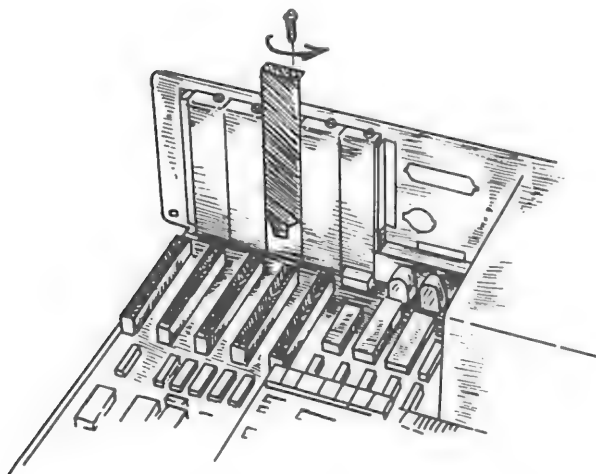


Figure 2-12: Removing the Expansion Slot Cover

---

## Second Serial Port Connection

If you have purchased the Second Serial Port option, it must be connected before the IDEA Supermax card is placed into the IBM AT. Once the card is inserted in the IBM, there is no room to slide the connector through the back of the housing.

The second serial port is located at the top of the IDEA Supermax Combination Card (refer to Figure 1-1). It is a 26-pin connector. The installation of the serial port ribbon cable (provided by IDEA) on the second serial port can be achieved by doing the following:

- Pass the 26-pin connector through the slot for the IDEA Supermax Combination Card. (Refer to Figure 2-13.)
- Align the Combination Card pins with the connector, and plug in the connector. Your second serial port is now RS 232C compatible.
- Fold the cable so that it lies flat against the board.
- Plug the 25-pin connector end of the IDEA ribbon cable (see Figure 2-18) into the 25-pin connector of the second serial port device. Your device is now connected.

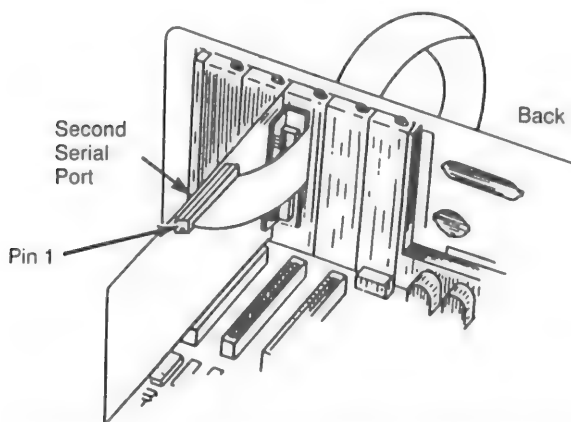


Figure 2-13: Attaching the Second Serial Port Cable

---

## IDEA Supermax Combination Card Insertion

Hold the combination card by the top corners, slide it down through the support guide, and firmly press it into the expansion slot you have selected. Be sure that the card is sliding in the support guide.

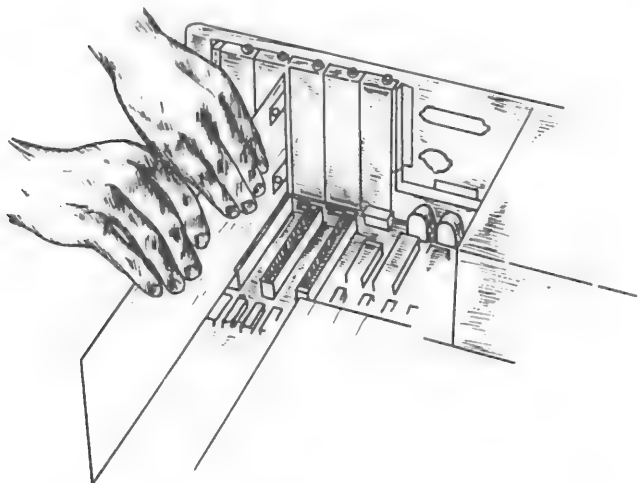


Figure 2-14: Inserting the IDEA Supermax Card



---

# IDEA Supermax Combination Card Alignment

Align the hole in the IDEA Supermax Combination Card retaining bracket with the hole in the rear panel of the computer. Use the screw you saved when you removed the slot cover. Place the screw into the hole and, using a flat-blade screwdriver, tighten the screw (refer to Figure 2-15).

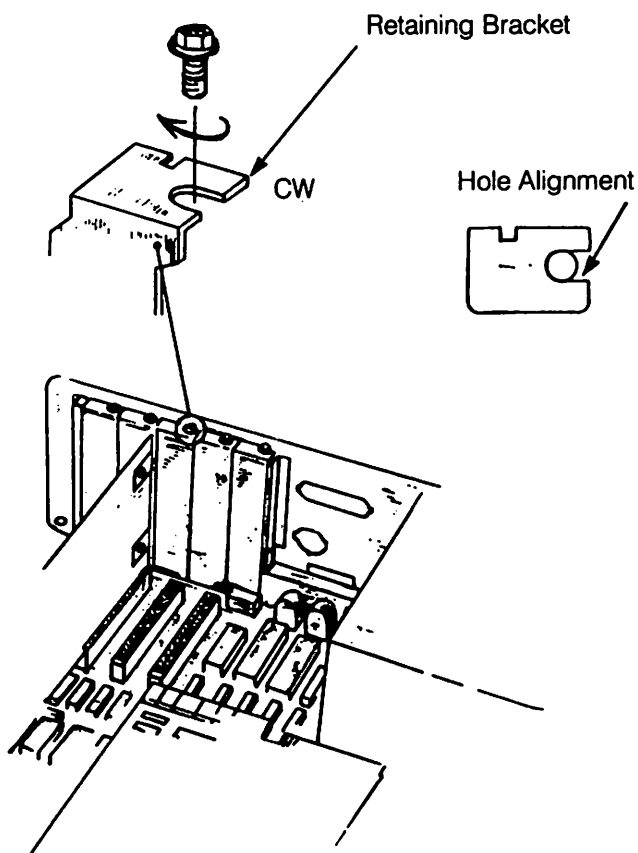


Figure 2-15: Aligning the Combination Card

---

# Replacing the IBM AT Cover and Recabling Your System

## Replacing the IBM AT Cover

- If you have any other options to install, do so now before replacing the cover.
- You may wish to test the system before replacing the cover.
- Replace the cover by positioning it as shown in Figure 2-16 and carefully sliding it toward the rear of the computer.

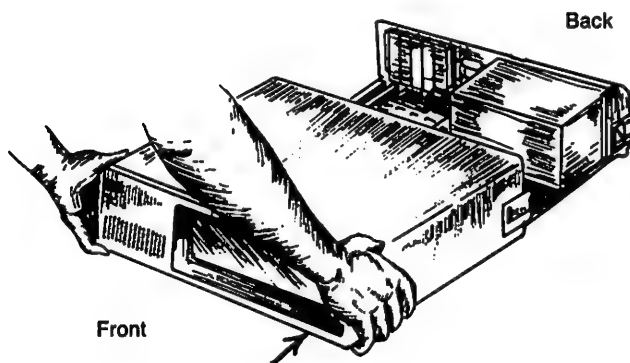


Figure 2-16: Replacing the IBM AT Cover

---

## Replacing the Cover Screws

- Once the cover is on, align the 5 screws with the holes. Using a flat-blade screwdriver, tighten the screws.
- Replace the back panel by pressing it onto the plastic fastener strips that hold it.
- Your system is now ready to be recabled and tested.

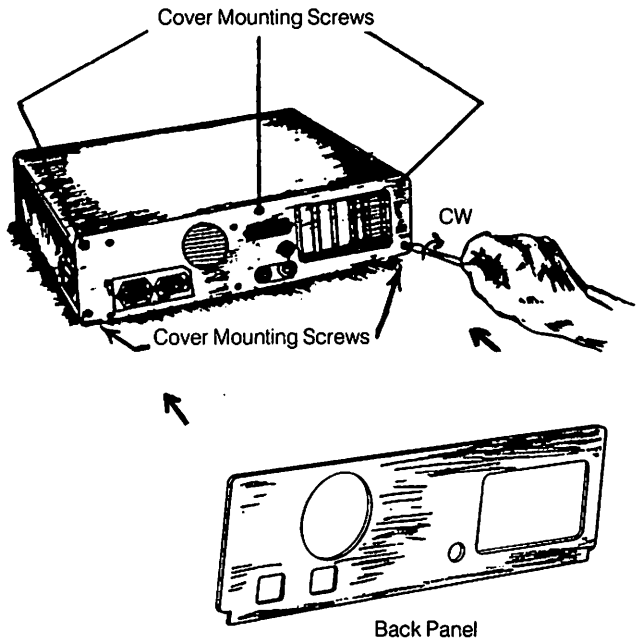


Figure 2-17: Replacing the Screws and Back Panel of the IBM AT

---

# Recabling Your System

## First Serial Port Connection

The First Serial Port 9-pin, male connector is mounted on the IDEA Supermax Combination Card above the Parallel Port. When properly installed, the connector extends through the retaining bracket. In order to make this port RS 232C compatible, you must attach the 9-pin, female end of the cable supplied by IDEA to the 9-pin, male connector on your IDEA Supermax Combination Card. To connect your serial port device, simply plug the 25-pin connector from the device into the 25-pin connector on the IDEA cable. Your device is now installed.

## Parallel Port Connection

The Parallel Port 25-pin, female, RS 232C connector is mounted on the card. When the card is properly installed, the connector extends out through the retaining bracket.

To install a device to this port, plug a 25-pin, male connector from the device into the IDEA Supermax 25-pin, female connector.

---

## Other Connections

Refer to Figure 2-13 and the text Second Serial Port Connection in this section.

Please refer to your notes or "Setup" in the *IBM AT Guide to Operations* for information on recabling the other elements of your system.

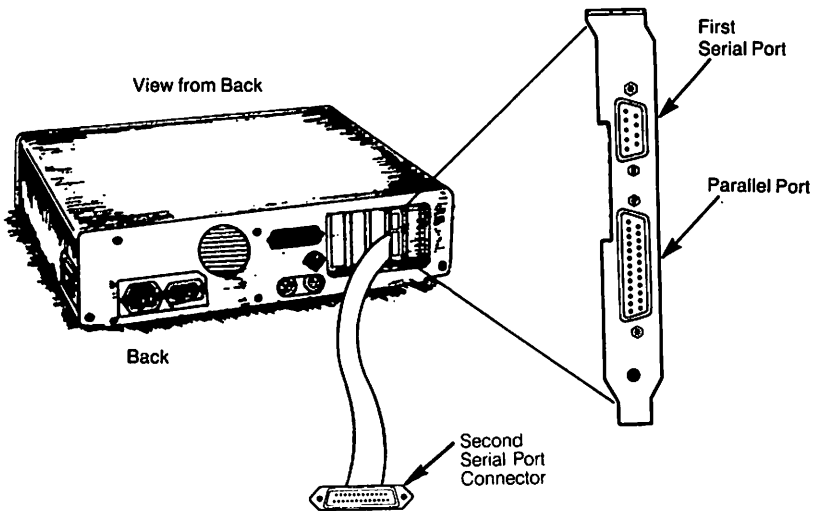


Figure 2-18: Recabling Your System



---

# **Section III:**

## **Software**

### **Installation**



#### **IBM Diagnostic Software**

After you have installed your IDEA Supermax Card and have reassembled the IBM AT, insert your operating system diskette into Drive A and turn the power switch ON. On powering up, the IBM AT automatically tests installed memory. The amount of memory found by the system is displayed in the upper left corner of the screen. Check this number against the number you placed in the box in Figure 2-6. They should match. If they do not match, memory chips in your system may be loose or damaged.

Note that upon powering up you may see a "164 Memory Size Error" message displayed. This error is normal. Until the IBM Setup Program is run, the system does not recognize that additional memory has been installed. If this error message is displayed after running the Setup Program, refer to Appendix A - Troubleshooting.

---

# Preliminary Information on Running the IBM Setup Program

Table 3-1 provides a quick means for you to determine both the Base Memory and Expansion Memory size required to answer the IBM Diagnostic Program queries. If the amount of memory in your system is not listed in this chart, you can calculate the memory size by following the information listed under Running the IBM Setup Program in this section.

To use Table 3-1, first determine the amount of memory on your Supermax card(s). If your IBM AT has 256K of memory, use the Base Memory and Expansion Memory figures in the 256K AT column. For example, if the Supermax card has 768K, you locate the line in the Supermax Memory column that shows 768K. Next, look across that line under the 256K AT column heading. The Base Memory is 640, and the Expansion Memory is 384.

If your IBM AT has 512K of memory, use the Base Memory and Expansion Memory figures in the 512K AT column. If the Supermax card has 768K, the Base Memory is 640, and the Expansion Memory is 640.

**NOTE:** If you previously added memory to your IBM AT system and you are adding a Supermax card, calculate your system's memory by following the instructions given in Running the IBM Setup Program in this section.

Also, remember to check the IBM AT jumper (refer to Setting the IBM AT Jumper in Section II).



---

Supermax Memory	256K AT		512K AT	
	Base Memory Entry	Expansion Memory Entry	Base Memory Entry	Expansion Memory Entry
128K	384	0	640	0
256K	512	0	640	128
384K	640	0	640	256
512K	640	128	640	384
640K	640	256	640	512
768K	640	384	640	640
896K	640	512	640	768
1024K	640	640	640	896
1536K	640	1152	640	1408
2048K	640	1664	640	1920
2560K	640	2176	640	2432
3072K	640	2688	640	2944
3584K	640	3200	640	3456
4096K	640	3712	640	3968

Table 3-1: Quick Reference Table for Answering the Base and Expansion Memory Queries in the IBM Diagnostic Program

---

## Running the IBM Setup Program

You must now run the IBM Setup Program. To do this, install the IBM Diagnostic Test disk into the system's drive. Move through the Setup Program until the following message is displayed:

---

### **Base memory is composed of:**

The maximum amount of memory you can enter in response to this query is 640K (base memory is that memory which resides between 0 and 640K). Memory above 640K is considered expansion memory and is part of the next query. To determine the actual memory, use the number you entered in the box in Figure 2-6, or add the amount of memory originally purchased with your IBM AT plus any options added plus the added memory purchased on IDEA Superm x. If your total memory is greater than 640K, enter only 640K.

If your total memory is less than 640K, enter that amount of memory (e.g., 512K) in answer to the Base Memory query.

Continue through the Setup Program. The next message displayed is:

---

### **Expansion memory is?**

If the amount of total memory in your system is larger than 640K, you must calculate the remaining memory in your system. In order to do this, subtract the 640K you entered in answer to the Base Memory query from the total memory (Figure 2-6). The difference is the number you enter in answer to the Expansion Memory query.

If you do not have additional memory above 640K, enter zero (0) in response to this query.

Continue to the end of the Setup Program.

---

# IDEA Memory Test Diagnostics

The IDEA Memory Test Diagnostics for the AT is a new diagnostic program capable of testing up to 16 megabytes of memory. This program uses a 64K buffer to allow for writing and reading large amounts of memory. Therefore, if this test is run from the command line, there must be at least 128K of good memory in the system. If the program is run from IDEAMenu, at least 256K of good memory is required. For this reason, it is recommended that the test be run from the command line, thus using less memory.

Whenever you run the IDEA Memory Test Diagnostics, you must use the original IBM AT DOS diskette (do not use an enhanced version that you have changed by adding cache buffers, etc.). This ensures that all memory, after DOS, is tested by the IDEA Memory Test.

IDEA Memory Test reads the system memory and examines the memory chips to determine if they are functioning properly. A memory map is displayed which provides a visual representation of your Combination Card.

## **Preliminary Steps**

1. Before executing the IDEA Memory Test, make a backup copy of the IDEAMenu distribution diskette, using the DISKCOPY command. Keep the original IDEAMenu diskette in a safe place and use the backup copy for daily use. Refer to your *DOS* manual for an explanation of the DISKCOPY command.
2. You can copy the IDEAMenu onto a diskette which has the DOS operating system, making it a bootable diskette, capable of starting your computer. Use the DOS COPY command. Note that IDEAMenu plus DOS may not fit on one diskette. If this is the case, eliminate those files you do not need in order to fit essential files. Label this diskette "boot." Refer to your *DOS* manual for an explanation of the COPY command. Otherwise, work with two separate diskettes - one with the DOS operating system, the other containing IDEAMenu. For the rest of this section, this manual assumes that you have made your IDEAMenu diskette bootable.

---

# Running the IDEA Memory Test Diagnostics

- 1. Insert the IDEAmenu disk into the IBM AT drive.
- 2. Type **IDEMTD** to execute the IDEA Memory Test.

The screen shown in Figure 3-1 is displayed. This screen is a visual display of the memory found.

```
AT EXTENDED MEMORY DIAGNOSTIC  VER 1.0
COPYRIGHT (c) 1985  IDEAssociates, Inc.

128K BLOCKS WITHIN MEG:
  0  1  2  3  4  5  6  7
M 00  G  G  G  G  G  G  RESERVED
E 01  G  G  G  G  G  G  G  G
G 02  G  X  X  X  X  X  X  X
S 03  X  X  X  X  X  X  X  X
    04  X  X  X  X  X  X  X  X
    05  X  X  X  X  X  X  X  X
    06  X  X  X  X  X  X  X  X
    07  X  X  X  X  X  X  X  X
    08  X  X  X  X  X  X  X  X
    09  X  X  X  X  X  X  X  X
    10  X  X  X  X  X  X  X  X
    11  X  X  X  X  X  X  X  X
    12  X  X  X  X  X  X  X  X
    13  X  X  X  X  X  X  X  X
    14  X  X  X  X  X  X  X  X
    15  X  X  X  X  X  X  X  X

CMOS MEMORY CONFIGURATION:
-----
SYSTEM          640K
EXTENDED        0K

DO YOU WANT TO TEST A RANGE (R) OF MEMORY, OR EXIT (ANY OTHER KEY)?
```

Figure 3-1: Visual Display of Memory

---

## IDEMTD ERROR MESSAGE, CAUSE, AND ACTION

The following error message may be displayed.

---

### Error shrinking current program

The most likely cause of this problem is insufficient memory to run or load memory diagnostics. Make sure you have loaded IDEMTD at the lowest possible memory location. No drivers, cache buffers, etc., should be loaded prior to memory diagnostics. If you determine that this is not the problem, type the following from the command line: **ATMEM**.

Whether the IDEMTD or the ATMEM command is executed, the program reads the amount of memory indicated in CMOS (CMOS stores configuration information) on your AT and outputs this information to the display (CMOS information becomes resident after the IBM Diagnostic Setup program has been run).

---

# Using the Memory Map to Identify Faulty Chips

A memory map is created as the program is run. The map finds and displays 128K functional memory blocks within each megabyte of memory. A "G" is displayed for functional memory and an "X" is displayed for nonexistent or nonfunctional memory.

If the map shows an "X" between blocks displaying "G's," the following error message is displayed:

**WARNING: NON-CONTIGUOUS INSTALLED MEMORY**

(Refer to Error Messages in this section and Figure 3-2.)

```
AT EXTENDED MEMORY DIAGNOSTIC  VER 1.0
COPYRIGHT (c) 1985  IDEAssociates, Inc.

128K BLOCKS WITHIN MEG:
      0  1  2  3  4  5  6  7
M 00 G  G  G  G  G  G  RESERVED
E 01 G  X  X  X  X  G  G  G
G 02 G  X  X  X  X  X  X  X
S 03 X  X  X  X  X  X  X  X
   04 X  X  X  X  X  X  X  X
   05 X  X  X  X  X  X  X  X
   06 X  X  X  X  X  X  X  X
   07 X  X  X  X  X  X  X  X
   08 X  X  X  X  X  X  X  X
   09 X  X  X  X  X  X  X  X
  10 X  X  X  X  X  X  X  X
  11 X  X  X  X  X  X  X  X
  12 X  X  X  X  X  X  X  X
  13 X  X  X  X  X  X  X  X
  14 X  X  X  X  X  X  X  X
  15 X  X  X  X  X  X  X  X

WARNING: NON-CONTIGUOUS MEMORY INSTALLED
DO YOU WANT TO TEST A RANGE (R) OF MEMORY, OR EXIT (ANY OTHER KEY)?
```

```
CMOS MEMORY
CONFIGURATION:
-----
SYSTEM      640K
EXTENDED    0K
```

Figure 3-2: Non-contiguous Memory

If your switch settings are correct, continue the test by using the "R" (range) feature.

At the bottom of the display (refer to Figure 3-2) is a query:

**DO YOU WANT TO TEST A RANGE (R) OF MEMORY, OR EXIT (ANY OTHER KEY)?**

To use range (R) and continue the test, press R. Enter the starting row and column and ending row and column you want tested. Refer to Figure 3-3. When typing the row and column references, do not use spaces between row and column designations. Make sure that you use a comma between the row and column specified. For example:

**PLEASE ENTER STARTING ROW AND COLUMN (row,col): 00,2**

**PLEASE ENTER ENDING ROW AND COLUMN (row,col): 01,3**

```

AT EXTENDED MEMORY DIAGNOSTIC  VER 1.0
COPYRIGHT (c) 1985  IDEAssociates, Inc.

Columns 0-7 128K BLOCKS WITHIN MEG:
M 00 G G G G G RESERVED
E 01 G G G G G G G
G 02 G X X X X X X X
S 03 X X X X X X X X
   04 X X X X X X X X
   05 X X X X X X X X
   06 X X X X X X X X
   07 X X X X X X X X
   08 X X X X X X X X
   09 X X X X X X X X
  10 X X X X X X X X
  11 X X X X X X X X
  12 X X X X X X X X
  13 X X X X X X X X
  14 X X X X X X X X
  15 X X X X X X X X

Rows 00-15

CMOS MEMORY CONFIGURATION:
-----
SYSTEM      640K
EXTENDED    0K

PLEASE ENTER STARTING ROW AND COLUMN (row,col): 00,1
PLEASE ENTER ENDING ROW AND COLUMN (row,col): 01,0

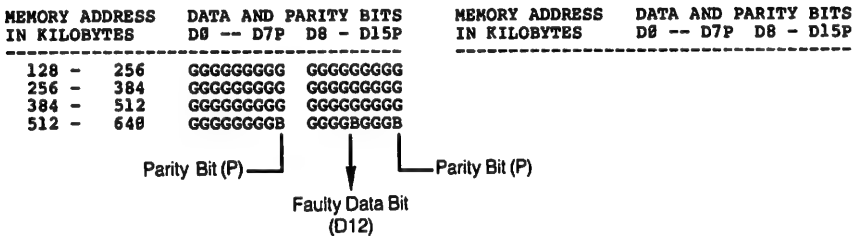
```

Figure 3-3: Example of Visual Display of Range Requested

The Range display provides the real address of the 128K blocks tested plus the 16 data bits and 2 parity bits (D0 - D7P) (D8 - D15P).

If all data tested was correct, a "G" is displayed under each data bit and parity bit. However, if a data error or address error occurred during testing, the bit(s) associated with the questionable data displays a blinking "B" under the bit(s). When a data error occurs, the parity bits associated with that 128K block also blink "B" (even if they passed the diagnostic test). This shows normal parity operation since data read is not equal to data written. If no data bits have a blinking "B" but the parity bits associated with a 128K block of memory ARE blinking, there is a problem with one or both parity chips within that 128K block of memory. Refer to Figure 3-4 and Appendix A (Troubleshooting) for instructions on locating faulty chips.

COPYRIGHT (c) 1985 IDEAssociates, Inc.



TESTING COMPLETE  
A:\>

Figure 3-4: Display of Faulty Data Bit and Associated Parity Bits



---

As each line is displayed on the screen, twenty-one tests are performed on each 128K block of memory. To freeze both the screen printout and the diagnostic test, press CTRL NUM LOCK. When you wish to resume the test and screen printout, press any keyboard key.

To exit from the diagnostics program before normal completion, press CTRL BREAK.

---

# Error Messages

**Message:** Warning - non contiguous memory

**Cause:** Wrong switch settings or bad memory chips.

**Action:** Check switch settings. If they are correct, continue with the test.

**Message:** Warning - check switch 4 on extended memory card

**Cause:** Memory Address Switch number 4 (refer to Figure 2-7) is set incorrectly.

**Action:** Check the setting of Memory Address Switch number 4. Reset this switch, if necessary.

**Message:** Not enough characters entered

**Cause:** You did not enter the minimum amount of characters for row,col entry.

**Action:** Enter at least 3 characters using a comma (,) as a delimiter.

**Message:** No delimiter (,) between row and column

**Cause:** You failed to enter a comma (,) between the row and column entry.

**Action:** Re-enter data using a comma (,) between the row and column entry.

**Message:** Invalid row entry

**Cause:** You entered an invalid row number.

**Action:** Re-enter a valid row number (0 - 15).

---

## Error Messages (cont.)

Message: Invalid column entry

Cause: You entered an invalid column number.

Action: Re-enter a valid column number (0 - 7).

Message: End row,column must be equal to or greater than start row,column

Cause: You entered an ending address that was lower than the start address.

Action: Re-enter end row,column.

Message: Invalid entry - program resident area

Cause: You entered a start address that was within the program area.

Action: Enter a higher row,column or try running the program from the command line.

Message: Invalid entry - system reserved area

Cause: You entered a start address that was within the RESERVED area.

Action: Enter a row,column that is not within the system reserved area (the area labeled RESERVED on the screen display of memory).



---

# Section IV:

## Using IDEAmenu



### How to Use IDEAmenu

The disk that accompanies the IDEA Supermax contains a collection of useful programs, some of which require the IDEA Supermax Combination Card in order to function. The IDEA Supermax programs on the diskette help you access the other programs.

You must first copy the combination card software to a bootable diskette. Note that IDEAmenu plus DOS may not fit on one diskette. If this is the case, eliminate those files you do not need in order to fit essential files. (Refer to your *DOS* manual for an explanation of the COPY command.) Label this diskette "boot."

Place the boot diskette in the system's drive and close the drive door. Next, type IDEAMENU and press ENTER to display the first menu (Configuration menu).

There are four menu screens. IDEAmenu's four screens are: Configuration, Utilities One, Utilities Two, and Diagnostics. Within each menu are function keys that perform specific tasks. Both Utilities menus reserve the function keys (F9) and (F10) for the purpose of selecting the Previous Menu (F9) or the Next Menu (F10).

**NOTE:** On Version 2.0 of IDEAmenu pressing ESC (escape key) while in any Help screen returns you to one of the four menu screens.

---

The highest amount of System Memory any one of the four screens will display is 640K. Any additional memory is treated as Extended Memory.

Each screen offers Help if you press (F1). After pressing (F1), press the function key that precedes the information you wish explained. For example, in IDEAMenu the first screen displayed is the Configuration Menu (refer to Figure 4-1). If you wish information about Configure Printer Spooler, press (F1) (for the Help screen) then press (F7).

IDEAMenu allows you to configure your boot diskettes to improve the efficiency and performance of your systems. You can individualize your system to perform a number of functions.

**NOTE:** The distribution diskette containing IDEAMenu is equipped with programs that may not be applicable to your system. IDEAMenu issues on-line messages to remind you that without certain peripherals, some functions do not work.

Once you are familiar with IDEAMenu, you can execute functions from the command line as well.

To access IDEAMenu, at the system prompt, type:

**IDEAMENU** and the Configuration Menu is displayed.

---

# Configuration Menu

system memory 512K		IDEAssociates		memory avail. 393K	
parallel(s) 1	IDEAmenu Configuration				serial(s) 1
game 0					floppy(s) 2
F1. Help F2. Return to System F3. Configure Ramdisk F4. Set Real Time Clock F5. Add RAMFLOPPY to CONFIG.SYS F6. Add Real Time Clock to AUTOEXEC.BAT F7. Configure Printer Spooler F8. Reboot System to Install Devices					
ENTER FUNCTION KEY :			F10. Next Menu		

Figure 4-1: Configuration Menu

---

The Configuration Menu lists function keys (F1) - (F8) and (F10). At the top of the screen, certain areas are mapped and contain information specific to your system's configuration.

It is important to set the switches on the IDEA Supermax card correctly, because IDEAMenu reads the number of devices installed: floppies, parallel port, serial ports, monitors (whether they are black and white or color), additional boards, and system memory from the switch settings.

The following summarizes the information listed on the Help screen for each function key pressed.

**NOTE:** Function keys (F5), (F6), and (F7) create a file if one does not already exist. Existing files must be less than 100 lines and less than 132 characters in line length.



---

## HELP Information

When the (F1) function key is pressed twice, the following is displayed:

Congratulations on your purchase of an IDEAssociates Combination Card for the IBM AT Computer. Before running this program you should have installed the memory card and reconfigured the systems board and/or the memory cards switch settings to reflect the additional devices and resources installed.

When you run the IDEAmenu install program, the menu displays pertinent system information and a selection of choices. This HELP file is displayed when the F1 function key is pressed. The menu queries the operating systems device vector to determine the devices installed and the available system memory. This aids you in determining if the switches are set correctly. Carefully inspect and reset the switches if the display reports devices or resources other than those you installed. If problems persist, please call your dealer or IDEAssociates Customer Support.

Please remember to fill out the warranty registration card and return it to IDEAssociates.

---

## Return to System

This option does not have a help screen. When (F2) is pressed, you exit from IDEAMenu and return to DOS.

---

## Configure Ramdisk

When the (F1) function key is pressed then the (F3) function key, the following screen is displayed:

This selection configures the size of the RAMFLOPPY that you wish to use. The RAMFLOPPY software reserves a selected amount of the main memory for use as a simulated floppy disk. Once the RAMFLOPPY program is in place, transfers to and from the RAMFLOPPY proceed 50 times faster than accesses to normal floppies. This function allows you to set the size of the RAMFLOPPY disk. The size of the RAMFLOPPY can be specified in increments of 32k.

Remember to leave at least 128k of memory for system use. The available memory is displayed in the upper right corner of the menu display.

See also F5.

**NOTE:** Configure RAMFLOPPY can be used only up to 640K. For memory above 640K, refer to IBM's DOS 3.0 Supplemental diskette. This diskette contains VDISK.LST which provides information on making a Virtual Extended Memory disk.

---

## Set Real-Time Clock

This function is not provided on the IDEA Supermax Card because the IBM AT comes with this feature.

---

## Add RAMFLOPPY to CONFIG.SYS

When the (F1) function key is pressed then the (F5) function key, the following screen is displayed:

This selection edits or creates a file called CONFIG.SYS. This function places an entry in the file to tell DOS to install the RAMFLOPPY as a DOS device driver. The device drivers are assigned drive letters in the order they appear in the file. The function places the device driver at the beginning or the end of the file. If the file does not exist it is created. More than one RAMFLOPPY can be installed, but this program allows only one entry to be placed in the file. The F3 function configures the size of the RAMFLOPPY. Remember to leave at least 128k main memory for the system use.

**NOTE:** To use RAMFLOPPYs of different sizes you must first configure the size of the device driver and then rename the file to another file name (e.g., REN IDERAM2.SYS IDERAM22.SYS). Then configure the size for the other RAMFLOPPY. Edit the CONFIG.SYS file and place the entry DEVICE = IDERAM22.SYS and DEVICE = IDERAM2.SYS in the file.

See also F3.

**NOTE:** You can have as many RAMFLOPPYs as you wish so long as you have enough memory. When the system is booted, it reads the CONFIG.SYS file. Drive locations are assigned to each RAMFLOPPY. For example, if you already have drives A, B, and C, the first RAMFLOPPY is assigned location D. To access the first RAMFLOPPY, change the prompt on your screen to drive D.

---

## Add Real-Time Clock to AUTOEXEC.BAT

This function is not provided because the IBM AT comes equipped with this feature.



---

## Configure Printer Spooler

When the (F1) function key is pressed and then the (F7) function key, the following screen is displayed:

This function edits the file AUTOEXEC.BAT to add entries for the print spooling function. If the IDESPPOOL entry exists in the AUTOEXEC.BAT file, it must be deleted before new spooler parameters can be configured. The IDEAssociates print spooler is a general purpose spooler that is used in the network as well as a single system unit. You may, however, elect to use the DOS print spooler PRINT.COM. If you use the DOS PRINT.COM then edit the file AUTOEXEC.BAT and place the filename in the file. Do not use both.

HELP for the configuration of the print spooler is available by selecting the (F7) function and then selecting HELP under the print spooler configuration menu.

---

## IDESPOOL

When the (F7) function key is pressed and then HELP under the print spooler menu is selected, the following information and screens are available:

**Purpose:** Installs IDEA Print Spooler. The first time this command is issued, it increases the resident size of DOS by approximately 10k bytes (larger if a larger buffer size is chosen). The Spooler uses background processing software which is contained in GENSKED.EXE and TIMESKED.EXE. Therefore you must install both of these programs before installing the Spooler.

**Format:** IDESPOOL -option1 -option2 ...

**Remarks:** The command is both parameter and menu driven. If the command is entered without any parameters, the menu is displayed and the user is requested to chose one of the available menu options. If the command is entered with parameters then the parameters are processed and the spooler installed if appropriate. All parameters must be separated by spaces. The following parameters are available:

- ? If a question mark is the only parameter entered, this on-line file is displayed.
- xx Spooler buffer size in 1K blocks: 4 to 64. The buffer size can only be changed when the spooler is first installed.
- device Installs device: PRN, LPT2, LPT3, COM1, or COM2.
- D Installs the Print Spooler to spool data to disk. This mode can only be changed when the spooler is first installed. (See **NOTE** below.)
- E Expands horizontal tab character to tab stops every 8 characters.
- F Formats printing into 60 lines per page with form feed between pages.
- I Installs the Print Spooler with default values: 4K buffer and PRN device.
- P Preserves horizontal tabs.
- T Terminates all printing in progress.
- U Unformat pages, turn off page formatting.

**NOTE:** If you wish to make a change after installation, you must change the AUTOEXEC.BAT file and reboot the system.



**\* MAIN MENU HELP \***

- |                                   |  |
|-----------------------------------|--|
| F1 - Display help file.           | F2 - Select Spooler Mode.<br>- Configure Spooler to send data to memory.<br>- Change tab expansion mode. |
| F3 - Select Spooler buffer size.  | F4 - Select Spooler Device.<br>- Add device as spool device.<br>- Delete device as spool device.         |
| F9 - Exit and cancel all changes. | F10 - Exit and install changes.  |

**\* MODE MENU HELP \***

- |   |   |
|---|---|
| F1 - Display help file.   | F2 - Configure Spooler to spool data to memory. |
| F3 - Configure spooler to expand tabs into spaces, with tab stops every 8 characters. | F10 - Exit menu, return to previous menu.       |

**\* CHANGE DEVICE MENU HELP \***

- |                                       |   |
|---------------------------------------|---|
| F1 - Display help file.               | F2 - Add device as a spool device. If already installed, devices can be added up to the maximum number for the current configuration. If installed as a single device then the current spool device can be changed. |
| F3 - Delete device as a spool device. | F10 - Exit menu, return to previous menu.   |

**\* DEVICE MENU HELP \***

- |                          |   |
|--------------------------|---|
| F1 - Display help file.  | F2 - Select PRN/LPT1 device.              |
| F3 - Select LPT2 device. | F4 - Select LPT3 device.                  |
| F5 - Select COM1 device. | F6 - Select COM2 device.                  |
|                          | F10 - Exit menu, return to previous menu. |

---

## Reboot System to Install Devices

This function does not have a Help screen. When (F8) is pressed, the system is rebooted to install devices.



---

# Utilities One Menu

From the Configuration Menu, press (F10) and the Utilities One Menu is displayed; it lists function keys (F1) - (F10).

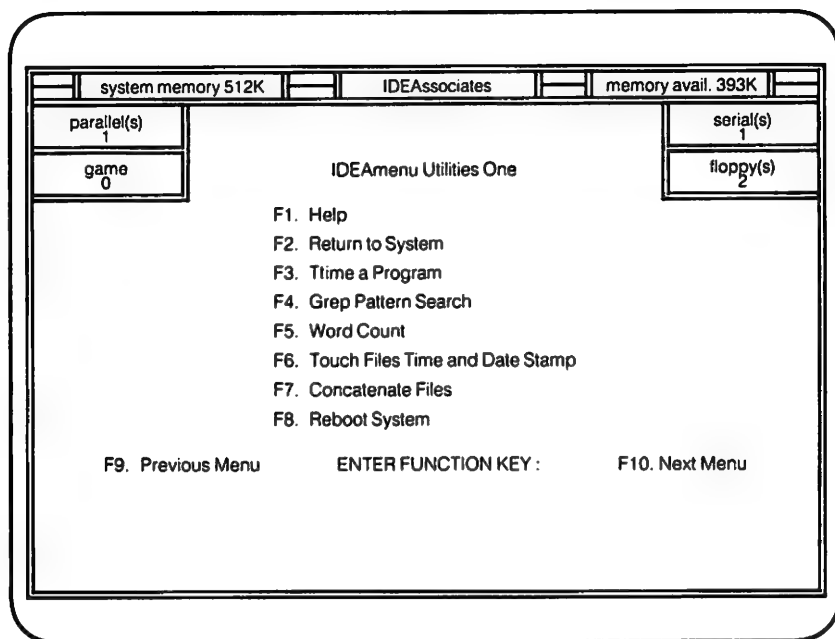


Figure 4-2: Utilities One Menu

The following summarizes the information listed on the Help screen for each function key pressed.

---

## Help

When the (F1) function key is pressed twice, the following screen is displayed:

The utilities provided are as follows:

**Time**    time the execution of a program.

**grep**    a pattern search utility more powerful than DOS FIND.

**wc**       a word count program.

**touch**   update a file's time and date stamp.

**cat**     concatenate files or type them onto the screen.

To execute a program, press the function key corresponding to the name of the program and then enter any arguments (such as options or filenames) and press (Return). The program executes and then waits for any key to be pressed to return to the Utilities One Menu.

---

## Return to System

This function does not have a Help screen. When (F2) is pressed, you exit from IDEAMenu and return to DOS.

---

# Ttime a Program

This option is not provided because the IBM AT comes with this feature.



---

## Grep Pattern Search

When the (F1) function key is pressed and then the (F4) function key, the following screen is displayed:

Usage: `grep [-bceilwvy] [pattern] [file...]`

Options:

- b With each output line, print the block number in which the line started. .
- c Print the count of matching lines rather than the lines.
- e The next argument is the pattern (useful if the pattern starts with '-').
- l Print the name of each file containing matching lines rather than the lines.
- n the line number in the file accompanies each line printed.
- v Print a line if the pattern is not found in the line.
- w Print the line only if it contains exactly the pattern; treat wildcards (\*) in the pattern as plain text.
- y, Lowercase letters in the pattern match both lower and -i uppercase letters on the input lines.

Example:

`grep getchar hello.c`

Searches though the file named `hello.c` for all occurrences of the string "getchar".

**NOTE:** Grep searches each file for occurrences of the pattern. If no file is specified, Grep searches the standard input (i.e., keyboard input). The pattern may be in quotes and may include wildcards.

---

## Word Count

When the (F1) function key is pressed and then the (F5) function key, the following screen is displayed:

### Usage:

`wc [-lwcpt] [-v] [-u] [-spagesize] [-bbaudrate] [d:][path][filename.ext]`

### Options:

-l	count lines
-w	count words
-c	count characters
-p	pages with 66 lines per page as a default (override with -s)
-t	time required to transmit file at baud rate specified.
-v	verbose .. all of the above
-sNN	any page size; default is 66
-bNNNN	any baud rate; default is 300
-filenames	can include drive designators, paths, and wildcards.

### Example:

`wc -v -b1200 c:\usr\dave\*.c`

Returns the lines, words, characters, pages, and the time required to transmit the file over a 1200 baud communications link.

**NOTE:** `wc` counts words, lines, and characters in each file named. If no file is given, `wc` uses the standard input (i.e., keyboard input). If more than one file is given, `wc` also prints a total. A word is defined as a maximal string of characters surrounded by white space (blanks, tabs, or new lines).



---

## Touch Files Time and Date Stamp

This option is not available because the IBM AT comes with this feature.

---

## Concatenate Files

When the (F1) function key is pressed and then the (F7) function key, the following screen is displayed:

Usage: cat [-cegmqrstv] [d:][path] filename.ext

Options:

- c count the number of characters in the file.
- n display the line number with the text.
- s single space text.
- g strip out graphics characters (upper 128 ASCII characters).
- m display the message --more-- and pause for any keystroke every 23 lines of the file.
- t replace tabs with the character sequence `\t`
- e show end of line with the character `$`.
- v (verbose) include the -t and -e options.
- q no header printed (this is done without information being displayed on the screen).

Example:

`cat -cs *.c > transmit.txt`

Types all the files in the current directory that have the extension 'c' and will strip off graphics characters, print line numbers, and will redirect the output to the file TRANSMIT.TXT.

---

## Reboot System

This function does not offer a Help menu. When (F8) is pressed, the system is rebooted.



# Utilities Two Menu

From the Utilities One Menu, press (F10) and the Utilities Two Menu is displayed; it lists the function keys (F1) - (F10).

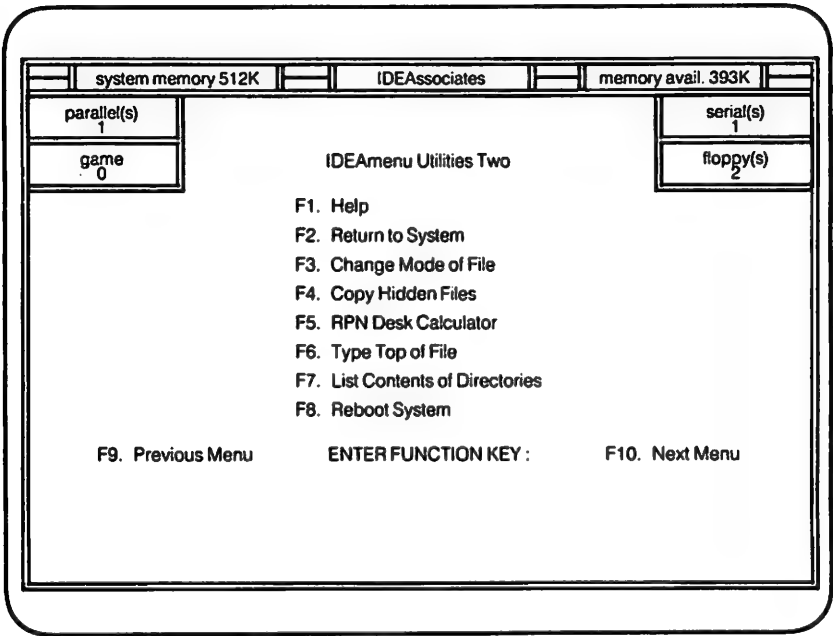


Figure 4-3: Utilities Two Menu

The following summarizes the information listed on the Help screen for each function key pressed.

---

## Help

When (F1) is pressed twice, the following screen is displayed:

The utilities provided are as follows:

- chmod    change the attributes of a file.
- scopy    allow copying of special hidden/system files.
- dc        an unlimited precision RPN desk calculator.
- head     text utility to type the first n lines of a file.
- ls        extended DOS DIR program.

To execute a program press the function key corresponding to the name of the program and then enter any arguments (such as options or filenames) and press return. The program executes and then waits for any key to be pressed to return to the main menu.

---

## Return to System

This function does not have a Help screen. When (F2) is pressed, you exit from IDEAMenu and return to DOS.



---

## Change Mode of File

When the (F1) function key is pressed and then the (F3) function key, the following screen is displayed:

Usage: `chmod [-bceilwv] [d:][path] filename.ext`

Options:

- a reset archive attribute to NOT backed up. This is useful for multiple backups of the same directory.
- h set attribute to a hidden file which is excluded from normal directory search. (However, it can be listed with LS.COM.)
- r set attribute to read only. Prevents accidental deletion.
- s set attribute to system file.
- g set attribute to general backed up file.
- q no header printed (this is done without information being displayed on the screen).

Example:

```
chmod -ra c:\usrdave\*.c
```

Changes the file attribute of all the files on drive c: in the directory \usrdave\ that end with an extension of c. The attribute is read only NOT backed up.

NOTE: The options -hrs and -g are mutually exclusive. A file can either be general or can be any combination of hidden\system\read only. The -a option can be used with any other options.

---

## Copy Hidden Files

When the (F1) function key is pressed and then the (F4) function key, the following screen is displayed:

Usage:

`scopy [d:][path] source.ext [d:][path]destination.ext`

Options:

Source.ext and destination.ext must be valid filenames.

Example:

`scopy a:ibmbio.com c:test.com`

Copies the hidden/system file `ibmbio.com` on drive `a:` to drive `c:` with the new name of `test.com`. The file attributes remain hidden/system.

NOTE: This is useful for copying read only files as well.



---

## RPN Desk Calculator

When the (F1) function key is pressed then the (F5) function key, the following screen is displayed:

### Usage: dc [file]

DC is an arbitrary precision desk calculator. It simulates a stacking calculator with ancillary registers. Input must be entered in reverse Polish notation. dc maintains the expected number of decimal places during addition, subtraction, and multiplication, but the user must make an explicit request to maintain any decimal places during division.

DC can read input from a file if specified, and then from the standard input (keyboard). DC accepts an arbitrary number of commands per line; moreover, spaces need not be left between them.

The scale factor of a number is the number of places to the right of its decimal point. the scale factor register controls decimal places in calculations. The scale factor does not affect addition or subtraction. It affects multiplication only if the sum of the scale factors of the two operands is greater than the set scale factor. The result of every division command has as many decimal places as it specifies. It affects exponentiation in that multiplication is performed as many times as the integer part of the exponent indicates; any fractional part of the exponentiation is ignored.

## Commands and Constructs

### number

Place the number on the stack. A number is a string of symbols taken from the set of digits '0-9' and the set of capital letters 'A - F' (usual hexadecimal notation), with an optional decimal point. An underscore as a prefix indicates a negative number. The letters retain values of 10 - 15 respectively regardless of the base chosen by the user.

### + - / \* %

The arithmetic operations are: addition (+), subtraction (-), division (/), multiplication (\*), remainder (%), and exponentiation (^). DC pops the two top stack elements, performs the desired operation by calling the multiprecision routine desired and stacks the result.

### c

Clear the stack. Does not clear registers.

### d

Duplicate the top of the stack so that it occupies the top two locations of the stack.

### f

Print the contents of the stack and the values of all the registers.

### i

Remove the top of the stack and use its integer part as the assumed input base (default 10). The new input base must be greater than 1 and less than 17.

### l

Stack the current assumed input base.

### k

Remove the top of the stack and put it in the internal scale factor register.

### K

Put the value of the internal scale factor register (which the k command sets) on the top of the stack.

### lx

Load the value of the register 'x' to the top of the stack. The value of register 'x' is unaltered. X may be any character.

- 
- o** Remove the top of the stack and use its integer part as the assumed output base (default 10). The specified base may be any positive integer.
  - O** Stack the current assumed output base.
  - p** Print the top of the stack. The value remains on the stack.
  - q** Quit the program; control returns to `command.com` or to `IDEAMenu`.
  - sx** Remove the top of the stack and store it in register 'x'. The previous contents of 'x' are destroyed. 'x' can be any character.
  - v** Replace the top of the stack by its square root.
  - x** Remove the top of the stack, interpret it as a string containing a sequence of `dc` commands, and execute it (see also [...] below).
  - X** Replace the top of the stack by its scale factor (i.e., the number of decimal places it has).
  - z** Place the number of occupied levels of the stack on the top of the stack.

[...]

Place the bracketed character string on the top of the stack. The string can be executed subsequently with the x command.

<x >x =x !<x !>x !=x

Remove the top two elements of the stack and compare them. If there is no '!' (NOT) sign before the relation, execute register x if the two elements obey the relation. If a '!' (NOT) sign is present, execute register x if the elements do not obey the relation.

Examples:

The following example program prints the first twenty Fibonacci numbers:

NOTE: The 'L's are typed in uppercase in the example to distinguish the ells (letter l) from ones (number 1). They must be entered in lowercase!!

1sa1sb1sc

[LaLbdsa + psbLc1 + dsc21 < y]sy enter as [lalbdsa + psblc1 + dsc21 < y]sy

Lyx enter as lyx

The following example program multiplies 12 and 11 and then raises 10 to the power of the resulting multiplication.

10 11 12 \*^p

Error messages:

Stack empty not enough stack elements to performed command as requested.

Out of pushdown no more room on the stack.

Nesting depth too many nested execution levels.

Out of space too many digits demanded.

Out of headers too many numbers being stored.

---

## Type Top of File

When the (F1) function key is pressed and then the (F6) function key, the following screen is displayed:

Usage: head [-n] [d:][path]filename.ext the default is 10 lines.

Example:

head -5 c:\usr\dave\\*.c

Reports the file name (if more than one file has an extension of '.c') and types the first 5 lines of the file.

---

## List Contents of Directories

When the (F1) function key is pressed and then the (F7) function key, the following screen is displayed:

Usage: ls [-adhlv] [d:][path] filename.ext

Options:

- no arguments list current directory
- a all files including subdirectories, . (current) , .. (parent), and hidden files.
- b include file size in column output.
- c single column output.
- d sort the files by date.
- e directories only.
- h help.
- l long listing: date, time, and backup information.
- s sort by filename.
- r reverse order of sort.
- t sort by time.
- z sum file sizes.

Example:

ls -acs c:\usr\bin\\*.exe

Outputs all files with extension of 'exe' sorted with one file per line of all the files in the directory \usr\bin on the drive 'c'.

**NOTE:** Sorts fields may be any combination of filename, date, and/or time.

---

## Reboot System

This function does not offer a Help screen. When (F8) is pressed, the system is rebooted.



# Diagnostics Menu

From the Utilities Two Menu, press (F10) and the Diagnostics Menu is displayed, listing function keys (F1 - F6), (F8), and (F9).

NOTE: Function key F7 is not active in this menu.

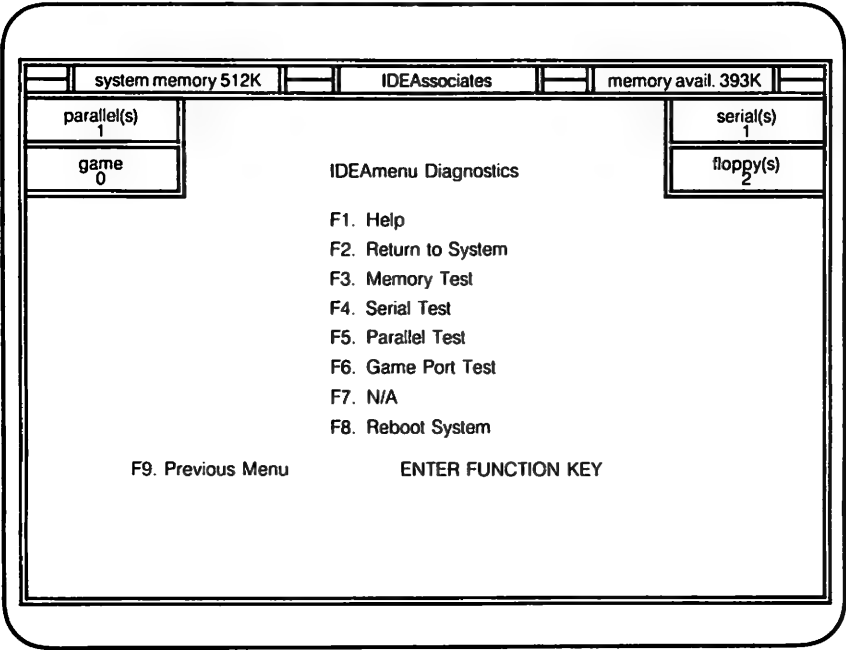


Figure 4-4: Diagnostics Menu

The following summarizes the information listed on the Help screen for each function key pressed.



---

## Help

When the (F1) function key is pressed twice, the following is displayed:

The utilities provided are as follows:

- idemtd      checks for proper operation of switch settings and memory banks.
- gio          checks to see if game port is working properly.
- idestd      determines which serial ports are active and which addresses they occupy.
- ideptd      determines which parallel ports are active and which addresses they occupy.

To execute a program, press the function key corresponding to the name of the program and then enter any arguments (such as options or filenames) and press (Return). The program executes and then waits for any key to be pressed to return to the Diagnostics Menu.

---

# Return to System

This function does not offer a Help screen. When (F2) is pressed, you exit from IDEAMenu and return to DOS.



---

## Memory Test

When the (F1) function key is pressed and then the (F3) function key, the following screen is displayed:

If you have system types PC, XT, or Portable

This diagnostic function tests installed memory. The system memory is determined and displayed as a map of 64K banks of memory. The memory map may not reflect the total memory installed due to improper switch settings and/or defective memory chips. Any unused memory banks are displayed as "X," functional memory banks are displayed as "G."

All available memory can be tested or a specific range can be tested by entering a row,column address and ending row,column. A nonfunctional bit is displayed in the memory map as a blinking "B." Consult the user documentation for additional information.

If you have system type AT:

ATMEM is a totally new diagnostic written to be used on an AT only. This program is capable of testing up to 16 megabytes of memory. Because this program uses a 64K buffer to allow for writing and reading such a vast amount of memory, it is necessary that, if run from the command line, there be at least 128K of known good memory in the system. If this program is run from IDEAMenu, at least 256K of known good memory is needed. (If this program is run from the lowest possible location in memory, the "128K/256K known good memory" would be memory purchased with the AT and would be the responsibility of the user and/or IBM.)

Once selected to execute, the ATMEN program reads the amount of memory indicated in CMOS on your AT and outputs this information to the display (CMOS information becomes resident after running IBM's Advanced Diagnostic "setup" on your AT).

Also displayed at this time is a "memory map of availability." This map is created as the program "scans" through memory and finds functional memory blocks. The map shows the location of functional 128K blocks within each megabyte of memory by displaying a "G" (non-functional or non-existent memory will be displayed as an "X").

If the map shows X's between blocks that are marked as G's, the following warning message is displayed: "warning: non-contiguous memory." This warning message indicates that you MAY have set the start address of the extended memory on your IDEA Supermax card at the wrong address, thereby creating a "gap" in the sequencing of memory blocks. The warning message can also appear because the memory block marked X between the G's is non-functional or bad. If the switches on your IDEA Supermax card are correct, continue the test using the "R" (range) feature explained below.

At the bottom of the display the following question is shown: "Do you want to test a range (R) of memory, or exit (any other key)?" Selecting "R" for range prompts you for additional input. You must enter a starting row and column, and an ending row and column. The row number should be equal within the megabyte. This is indicated on the map as the left-most vertical line of numbers 0-15 labeled "MEGS." The column number should equal the 128K block within the megabyte. This is indicated on the map as the top horizontal line of numbers 0-7 labeled "128K BLOCKS WITHIN MEG."

Once "R" is selected and you input valid data, the display changes to a new "page." This page shows the real address of the 128K blocks being tested as well as the 16 data bits and 2 parity bits (D0-D7P) (D8-D15P). Normally under each data bit and parity bit a "G" will be displayed. If during testing of a block, a data error or address error occurs, the bit or bits associated with the bogus data will be shown as a blinking "B." This means that the chip(s) are defective.

Note that when a data error occurs, the parity bits will also blink "B." This shows normal parity operation since data read is not equal to data written. If there are no data bits shown as blinking "B," and the parity bit IS blinking "B," then that chip(s) has a parity problem and is defective.

As each line is displayed, 21 tests are performed on each 128K block. If a data or parity error occurs, use the 'memory address in kilobytes' column data and the table in this manual to help you identify the chip(s) that is defective on your IDEA Supermax card. If you want to stop the display, press the CTRL NUM LOCK keys. If you want to exit the program before normal completion, press CTRL BREAK.

---

## Serial Test

When the (F1) function key is pressed and then the (F4) function key, the following screen is displayed:

Command Line Format: idestd

This diagnostic determines which serial ports are active and which addresses they occupy.

---

## Parallel Test

When the (F1) function key is pressed and then the (F5) function key, the following screen is displayed:

Command Line Format: ideptd

This diagnostic determines which parallel ports are active and which addresses they occupy. The printer ports can be tested by connecting a printer and selecting the desired port. If the parallel port is functioning properly, the video output matches the printer output.

If only 1 parallel port is installed, DOS print commands recognize it as LPT1 regardless of the configured port address.

---

## Game Port Test

When the (F1) function key is pressed and then the (F6) function key, the following screen is displayed:



The Game Port is not provided; therefore, the Game Port Test is not used.

---

# Reboot System


This feature does not have a Help screen. When (F8) is pressed, the system is rebooted.





---

# Appendix A: Troubleshooting



This section helps you identify and correct minor memory, parallel port, and serial port problems you might encounter.

If you cannot resolve the problem, call the dealer from whom you purchased the card. If the dealer cannot resolve the problem, call IDEA Technical Support at (800) 257-5027.

## Memory Problems

After installing the IDEA Supermax Combination Card and powering up, your screen displays a "164 Memory Size Error." This is normal because the system does not recognize the additional memory installed until after the IBM Setup Program is run.

Run the IBM Setup Program and reboot. If your screen still displays a "164 Memory Size Error," you have entered incorrect information in answer to the Setup Program's query for amount of Basic and Extended Memory. Rerun the Setup Program and recheck the information you supplied.

If your screen displays a 201 error code, there is a data or parity error.

---

A 202 or 203 error code means that there is an address error. Recheck the memory switch settings on the IDEA Supermax card to be sure that you set the switches for the correct memory address. Pay particular attention to switch #4 on the memory switches to be sure that you used the correct setting.

On an IBM AT with 256K original memory, if the error message displayed begins with "03" or a lower number, the problem is in the original 0 - 256K memory of the IBM AT.

On an IBM AT with 512K original memory, if the error message displayed begins with "07" or a lower number, the problem is in the original 0 - 512K memory of the IBM AT.

Refer to "Testing Your IBM" in the *AT Guide to Operations*.

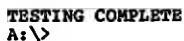
---

## Locating Faulty Chips

In order to pinpoint a defective memory chip or parity chip, run the IDEA Memory Test Diagnostics. Remember to use your original, unaltered DOS diskette to run this program. Refer to Section III for instructions on running the IDEA Memory Test Diagnostics

Once your screen displays an error (blinking B), use the following information to locate the questionable chip. The procedure is the same for a parity or a memory chip.

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## A-4 Troubleshooting

---

In order to locate the position of the blinking "B" in Figure A-1, you must first determine which "B" is the memory chip and which "B" is the parity chip. Remember, when a memory chip does not pass the diagnostic test, the parity chips associated with that block of memory display a blinking "B" also.

To find the chip, use the DATA BITS and PARITY BITS locations (refer to Figure A-1). The Data Bits locations start with D0 and end with D7 for the first half bank. The second half bank begins with D8 and ends with D15. Parity bits are designated by a (P). In this example, the blinking "B" is located at D12 which is a memory chip location. D12 only indicates the position of the chip; it does not provide the location of the memory bank where the D12 chip resides.

To locate the proper bank of memory, you must know your starting address (starting address is the number you entered in Figure 2-4). The starting address consists of the original memory purchased with the AT plus any options (do not count the IDEA Supermax memory). In this example, the starting address is 256K.

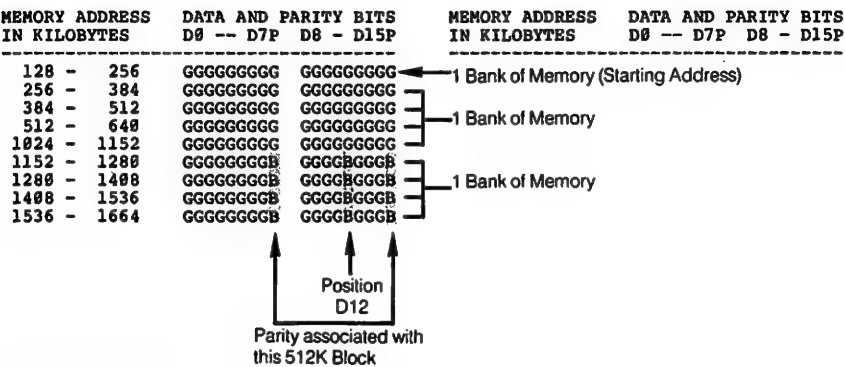
Refer to the MEMORY ADDRESS IN KILOBYTES column in Figure A-1. This column lists 128K blocks of memory. Locate your starting address in the Kilobytes column. In this example the first 256K of memory (the starting address) is located on your IBM AT system board. If the blinking "B" had been located within that memory (bank 1), the problem would be found within original AT memory chips. Because the starting address is 256K and the blinking "B" is located in the 512K range, the error can be found in Memory Bank 3, slot 12 of the IDEA Supermax Card.

If the starting address in this example had been 512K, the blinking "B" would be located in Memory Bank 1, slot 12 on the IDEA Supermax Card.

**Example 2 - Locating a Faulty Chip on a Board with 256K Chips - Starting Address 256K**

Figure A-2 shows an example of information displayed when your board is populated with 256K chips.

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TESTING COMPLETE  
A:\>

Figure A-2: Example - Locating a Blinking "B" Position on a Board with 256K Chips (Starting Address is 256K)

---

Finding the position of the blinking "B" chip in Figure A-2 and using the starting address to determine on which Memory Bank the chip is located is identical to the procedure described in the example in Figure A-1. What is different is the screen display for one bank of memory when the board has 256K chips. After the Starting Address, one bank of memory consists of FOUR 128K blocks of memory on the screen display. In this example, the blinking "B" is located in Memory Bank 2, slot D12 of the IDEA Supermax Card.

---

# Parallel Port Problems

If the printer does not function or it prints garbled text, check the following.

- Make sure that the printer is supported by the IBM AT and its operating system.
- Check the independent operation of the printer with the "self-test," if available. Check your printer manual.
- Check for loose connections and improper cabling.
- Check the switch settings on the IDEA Supermax Combination Card.
- Check the software/hardware compatibility. See Appendix B, and review interface connection diagrams.
- Run the IBM Diagnostics Program.



---

# Serial Port Problems

The RS 232C Serial Communication Port on the IDEA Supermax Card meets all specifications for the RS 232C standard supported by the IBM AT Asynchronous Communications Controller. The signal names and directions are shown in Appendix B.

The majority of the RS 232C signals are used to control modems for communication to and from phone lines. However, many serial printers do not support all RS 232C functions. A special cable may be required to assure that the IBM AT can communicate with your printer.

In addition, all printers do not support the same control characters. This means that even if the cable is correct, the IBM AT may not send the correct printing sequence. The safest course is to use a printer that IBM supports. Use of an unsupported printer may require special software.

If the device (modem, printer, etc.) does not function properly, check the following items.

- Check independent operation of the device using the IBM Diagnostics Program.
- Check for loose connections and improper cabling.
- Check switch settings on the IDEA Supermax Combination Card. Review Section II.
- Check software/hardware compatibility. See Appendix B, and review interface connection diagrams.



---

# Appendix B: Optional Switch Settings for Advanced Users



The recommended switch settings are given in Section II. Alternate switch settings are listed in the following text.

The Hex address gives the starting offset address for the serial and parallel ports. An "A" in the binary address equivalent indicates the bits that control access to registers in the port. An "X" designates masked bits. References to the various registers can be found in the *IBM AT Technical Reference*. The sections for each port are listed below. The I/O address map for the IBM AT is in Section 1 of the *IBM AT Technical Reference*.

---

Interface Addresses		Logical Addresses	
Port Name	Hex	Binary	
		MSB	LSB
* Serial Port 1	3F8-3FF	0011 1111	1A <sub>2</sub> A <sub>1</sub> A <sub>0</sub>
* Serial Port 2	2F8-2FF	0010 1111	1A <sub>2</sub> A <sub>1</sub> A <sub>0</sub>
** Serial Port 3	218-21F	0010 0001	1A <sub>2</sub> A <sub>1</sub> A <sub>0</sub>
*** Parallel Port 1	378-37F	0011 0111	1XA <sub>1</sub> A <sub>0</sub>
*** Parallel Port 2	278-27F	0010 0111	1XA <sub>1</sub> A <sub>0</sub>

Figure B-1: Optional Switch Settings

---

## Interrupt Lines

### Port Name Bus Selected Interrupt Lines

- \* Serial Interrupt for COM1 IRQ4
- \* Serial Interrupt for COM2 IRQ3
- \*\* Serial Interrupt for COM3 IRQ2
- \*\* Parallel Primary Interrupt IRQ7
- Parallel Secondary Interrupt IRQ5

Figure B-2: Interrupt Lines

### Footnotes

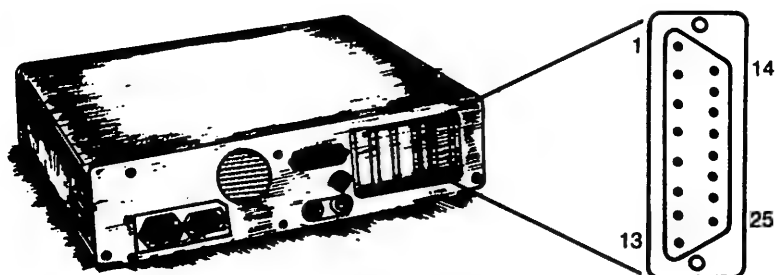
- \* Please refer to the *IBM AT Technical Reference*, Section 1, p. 1-10.
- \*\* Please refer to Appendix D for register control information.
- \*\*\* Please refer to the *IBM AT Technical Reference*, Serial/Parallel Adapter section.



# Appendix C:

## Interface Connector Specifications

### Parallel Port



AT STANDARD TTL LEVELS

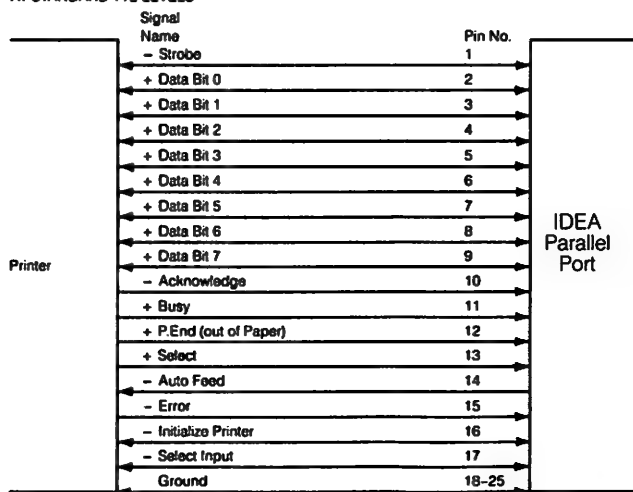
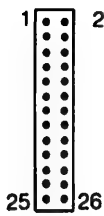


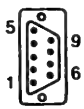
Figure C-1: Parallel Port Connector Specifications

# Serial Port

26-pin Connector

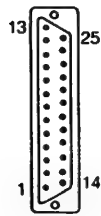


9-pin Connector



Male Polarity

25-pin Connector



Male Polarity

All Standard Levels			
Description	26-pin	9-pin	25-pin
Signal ground	1		
NC			1
Transmit data	3	3	2
Receive data	5	3	3
Request to send	7	7	4
Clear to send	9	8	5
Data set ready	11	6	6
Signal ground	13	5	7
Carrier detect	15	1	8
NC	17		9
NC	19		10
NC	21		11
NC	23		12
NC	25		13
NC	2		14
NC	4		15
NC	6		16
NC	8		17
NC	10		18
NC	12		19
Data terminal ready	14	4	20
NC	16		21
Ring indicate	18	9	22
NC	20		23
NC	22		24
NC	24		25
NC	26		

External Device

IDEA Serial Port

**Note:** To avoid inducing voltage surges on interchange circuits, signals from interchange circuits shall not be used to drive inductive devices, such as relay coils.

NC: No Connection


Figure C-2: Serial Port Connector Specifications



---

# Appendix D:

## Serial Port COM3



IDEA has supplied an address and interrupt combination to allow you to define COM3.

The address is 218-21F Hex.

The interrupt is IRQ2.

Since these are not standard IBM locations, standard IBM software will not find the COM3 port. However, you may be able to use the port for your own purposes.

The register offsets for COM3 are the same as those for COM1 and COM2, except that the base address is 218 Hex.

Make sure that your use of COM3 does not conflict with the operations of other hardware in the system (e.g., interrupt IRQ2 is used by IDEAnet).



---

# Appendix E:

## Technical Specifications

The IDEA Supermax Combination Card is designed to operate with the IBM AT without hardware modifications.

### Power Requirements

+ 5 Vdc 2.5A	Typical (Fully Configured with 256K RAMS)
+ 12 Vdc 34mA	Serial Ports Only
-12 Vdc 34mA	Serial Ports Only

### Temperature

Operating	50°F to 112°F (10°C to 44°C)
Non-Operating	- 40°F to 140°F (- 40°C to 60°C)

### Dimensions (box)

Length	14.27 inches	(363.5 mm)
Width	5.94 inches	(150.8 mm)
Thickness	2.06 inches	(52.3 mm)
Weight	14 ozs.	(396.9 gm)
Shipping Wt.	1 lb. 14 ozs.	(850.5 gm)

---

### Serial (RS 232C) Port

Connector 25 D subminiature shell male. Meets EIA Standard RS 232C.

### Parallel Printer Port

Connector 25 D subminiature shell female.

### Electrical Specifications

Pin 2 through Pin 9 Source 5 mA. Sink 32 mA.

Pins 1, 14, 16, 17 driven by open collector drives pulled to + 5V through 4-7K ohm resistors. Sink 30 mA.

Pins 10, 11, 12, 13, 15 High level input sink 0.1 mA. Low level output source 0.4 mA.

Pins 18 through 25 ground.

---

# Appendix F:

## Glossary



### **Asynchronous communications.**

Method of communications where data is sent as soon as it is ready.

### **Asynchronous communications interface adapter.**

A device providing the data formatting and control necessary to permit asynchronous communications with a microcomputer.

### **ASCII.**

American Standard Code for Information Interchange. A coding scheme wherein letters, numbers and special symbols are represented as unique seven-bit values, allowing for standardization between data communications devices.

### **Back-up.**

A duplicate copy of data.

### **Baud.**

Unit related to bits per second, used to measure the rate at which information moves between computers.

---

**Bit.**

Abbreviation for "Binary digit." A bit is the smallest unit of information recognized by a computer, expressed as the digits 1 or 0.

**Bits-per-second (bps).**

The instantaneous bit speed with which a device or channel transmits a character.

**Boot.**

Refers to powering-up the operating system.

**Buffer.**

Temporary storage, for characters that need to be collected prior to processing.

**CMOS RAM chip.**

Complementary Metal Oxide Semiconductor. This chip contains configuration information in an IBM AT.

**Cable.**

A group of wires connecting two or more pieces of equipment.

**Channel.**

A path along which signals or information can be sent.

**Character.**

An alphanumeric symbol.

---

**Data rate.**

The speed at which data is sent to a receiving computer or device, measured in bits-per-second.

**Disk controller.**

A hardware device that controls a physical disk drive.

**Disk operating system (DOS).**

The operating system for the IBM AT.

**Drive control cable.**

A cable for transmitting control information between the computer and the disk controller.

**Drive data cable.**

A cable for transmitting data between the computer and the disk controller.

**Drive power connector.**

The components for connecting power to the disk drive.

**EBCDIC.**

Extended Binary Coded Decimal Information Code. A coding scheme wherein letters, numbers and special symbols are represented as unique six-bit values, allowing for standardization between data communications devices; popularized by IBM.

**Echo.**

Displaying information sent or received on the terminal, to visually detect transmission errors. Remote echo comes from the host computer. Local echo comes from your transmission.

**Formatted disk.**

A disk that has been initialized with DOS.

---

**Full-duplex.**

Communication channel capable of transmitting and receiving data simultaneously.

**Host adapter.**

A hardware device that serves as a link between the IBM AT and the disk controller.

**Host computer.**

Primary or controlling computer in a multiple computer system. The smaller computers depend upon the host computer to allocate the resources of the system.

**Interrupt.**

A processor feature that allows the currently executing program to be deferred in favor of servicing another.

**Kb.**

Abbreviation for kilobyte. One kilobyte consists of 1,024 bytes (characters) of information.

**Logical drive.**

A logical portion of a physical disk drive.

**Off-line.**

Communications devices not physically connected to or using a communications medium.

**On-line.**

Communications devices physically connected to and using a communications medium.



---

**Option memory.**

RAM memory located on option boards.

**Parallel transmission.**

Simultaneous transmission of all bits in a byte.

**Parallel port.**

Interface located on a host adapter card used to connect a disk drive or printer to the computer.

**Parity.**

The integrity of each character transmitted over a communications link can be tested by generation and subsequent checking of character parity. Parity is computed using the bit-wise "or" of the character bits and adding an extra bit to cause the result to be even or odd.

**Parity chip.**

Controls parity.

**Partition.**

A portion of a hard disk with a size expressed in the disk sectors.

**Peripheral.**

A noncomputing input or output device, such as a printer or hard disk drive.

**RAM.**

Random access memory. Items in RAM can be randomly retrieved and augmented. Each byte can be accessed regardless of its location. Information is eradicated when the computer is turned off.

---

**Read/Write Head.**

The component of a disk drive which senses the signals recorded on the magnetic media.

**Real time.**

Pertaining to the actual time during which a physical process transpires.

**Reboot.**

Refers to bringing-up the operating system in the middle of a session. This is accomplished by pressing the Ctrl, Alt and Del keys simultaneously.

**Remote drive.**

Disk drive located at a distance from your computer workstation.

**RS-232C.**

The interface between data terminals and data communications devices using serial data transfer is, to some degree, defined by this standard.

**RS-232C cable.**

Standard communications connect cable, similar to cable used to connect a television to an antenna.

**Serial port.**

Common serial communications interface used by modems and printers.

**Serial transmission.**

Communications method where data is sent in a regular pattern of bits.

**Server PC.**

Microcomputer used by network as source of disk drives and information.

---

**Shell D connector.**

Plug shaped like the letter "D".

**Spooling.**

Simultaneous Peripheral Operations On-Line. Process of allowing programs using slow output devices to complete execution rapidly. Data is temporarily stored in buffers or queues for later low-speed printing concurrent with normal system operation.

**Synchronous communications.**

Communication method where speed and flow of information being transmitted is controlled by equally spaced clock signals or pulses.

**System memory.**

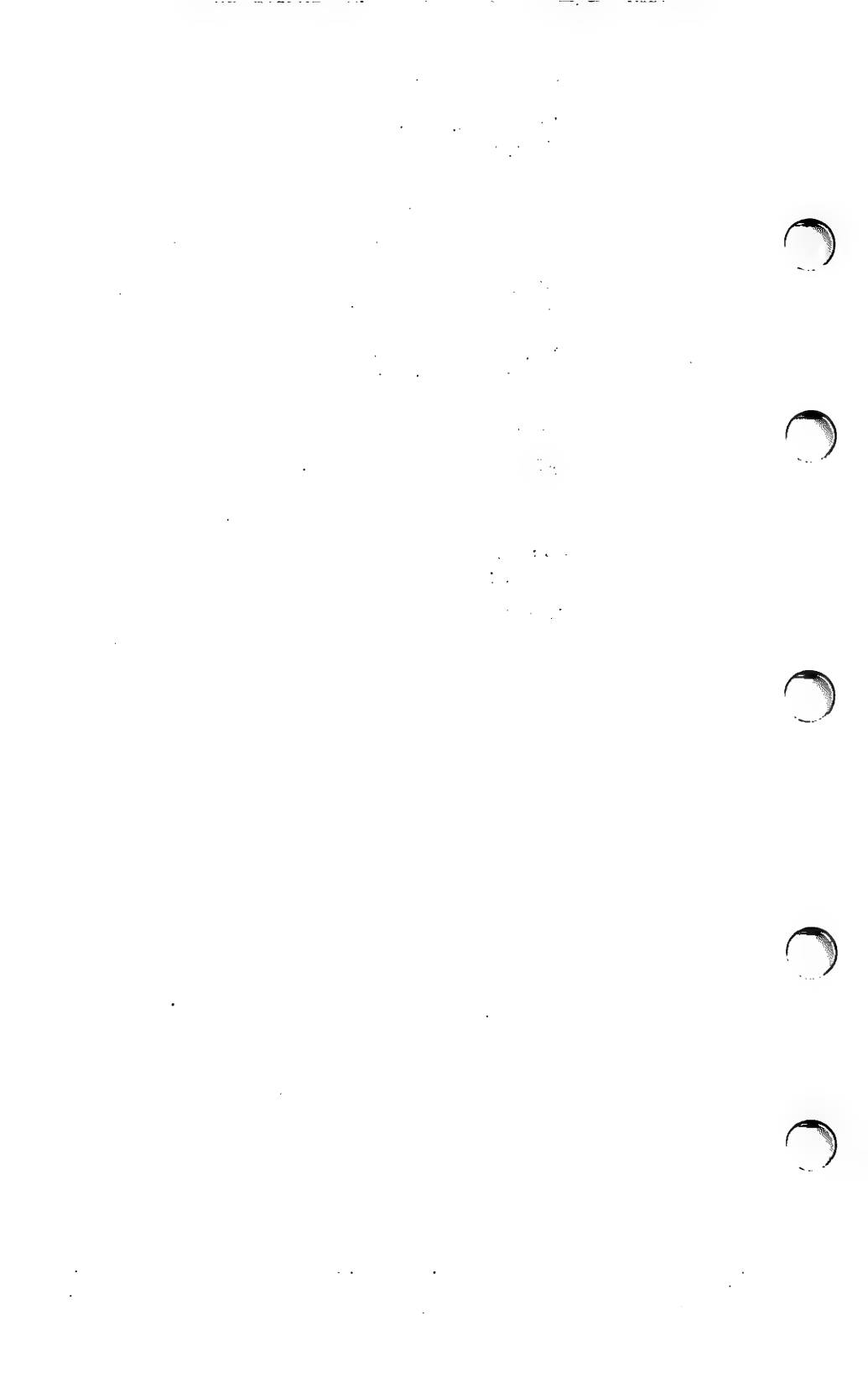
The amount of RAM installed on the IBM AT system board.

**Transfer rate.**

See Data rate.

**User PC.**

Microcomputer used as a workstation in a network.



---

# Appendix G:

## Customer Support Information

### Upgrade Policy

When you order an upgrade from IDEAssociates, IDEA will send you the upgraded product. After receiving the new product, you must return the original to us in the proper shipping container. If your original product is still under warranty, the full purchase price of the original product will be applied toward the price of the upgrade. If your product is outside of the warranty period, IDEA will apply a percentage of the price of the original product toward the selling price of the upgrade.

### IDEA Supermax Upgrades

Upgrades can be ordered with 64K or 256K memory chips. Once the IDEA Supermax Combination Card (motherboard) is populated, a daughterboard can be added providing up to an additional 5 banks of memory. Serial ports and a parallel port can also be added.

### Repair Policy

If your product is are still under the original one year limited warranty, IDEAssociates will replace your product at no charge to you. If your product is out of the warranty period, IDEA will repair the board and charge you on a time and materials basis.

---

Before returning your product, you must take the following steps:

1. Contact your dealer about the problem.
2. If the dealer is unable to resolve the problem, call IDEAssociates at (800) 257-5027.
3. If your product needs replacement or repair, IDEAssociates' technical support personnel will issue you a Materials Return Authorization (MRA) number.
4. Box your product in the original shipping container or other secure package. Write your return (MRA) number on the top of the box.
5. Ship by the most economical means available to:

IDEAssociates, Inc.  
35 Dunham Road  
Billerica, MA 01821

## Warranty Card

Please fill in the enclosed warranty card and return it promptly. Remember to record the serial number of your product both on the return card and in your manual.

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# Appendix H:

## IDEA Supermax

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**IDEA Supermax<sup>®</sup>**

**[REDACTED]**

**Quick  
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Card**

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The best IDEAs for personal computers.

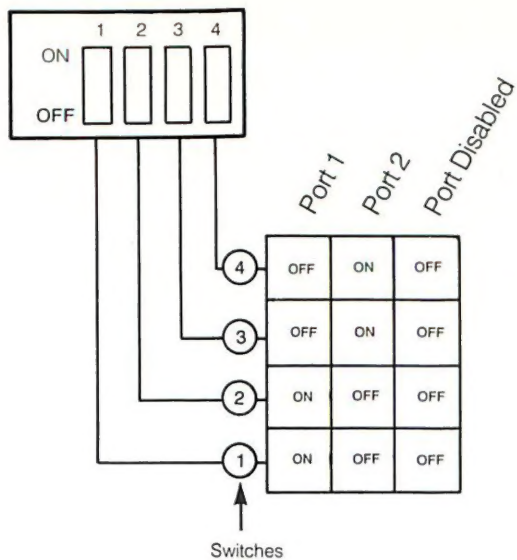
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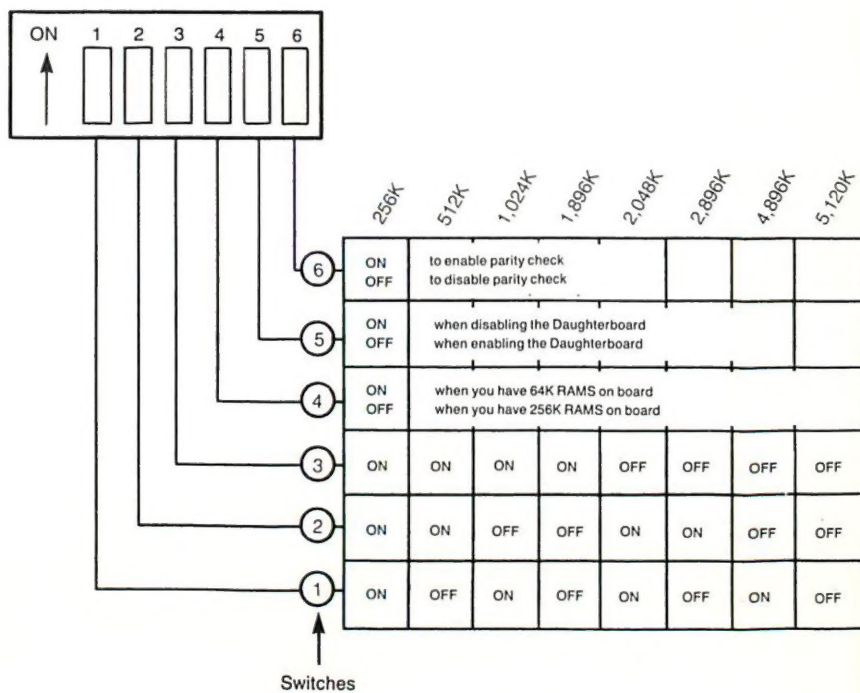
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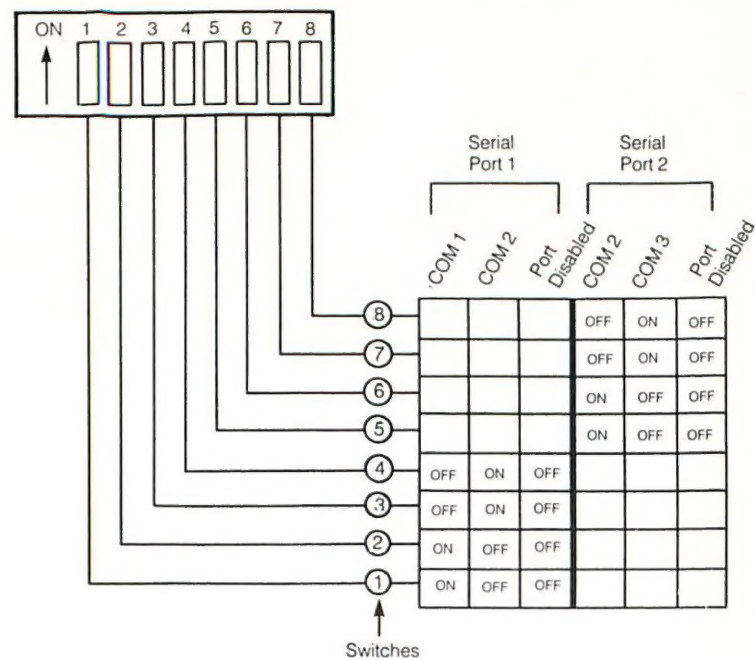
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PARALLEL PORT SWITCH SETTINGS



MEMORY SWITCH SETTINGS



SERIAL PORT SWITCH SETTINGS

